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Strain Surveys of Fuel Flow Vent Hole Number 13 and Stiffener Runout Number 2 in the F111 Wing Pivot Fitting for a Range of Rework Shapes

Kevin C. Watters

DSTO-TR-0567

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Kevin C. Watters

Airframes and Engines Division
Aeronautical and Maritime Research Laboratory

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ABSTRACT

The strain distributions and magnitudes at two locations in the D6ac steel wing pivot fitting (WPF) of the F-111 aircraft have been evaluated by full-scale test of a wing. These locations, known as fuel flow vent hole number 13 and stiffener runout number 2 have been sites of in-service fatigue cracking. The structural features at these two locations produce large stress concentrations and extensive yielding occurs around them under cold proof load testing (CPLT) of the wing (which was simulated in these tests). These locations are subject to in-service reworking to remove detected fatigue cracks, and a range of reworks was simulated in these tests. The interaction of residual stress/strain states (after cyclic plasticity from CPLT loading) and material removal (during reworking) made interpretation of the strain versus load behaviour quite difficult. The difficulty was compounded by an overriding bi-linear elastic structural behaviour of the WPF and complex structural behaviour of the shear web in the WPF. A comprehensive strain versus load data base has been established for these locations to facilitate stress and fatigue analyses.

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Strain Surveys of Fuel Flow Vent Hole Number 13 and Stiffener Runout Number 2 in the F-111 Wing Pivot Fitting for a Range of Rework Shapes

Executive Summary

This report describes a series of full-scale static strain surveys of two critical areas in the D6ac steel wing pivot fitting (WPF) of the F-111 aircraft wing. The two areas are fuel flow vent hole number 13 (FFVH#13) and stiffener runout number 2 (SRO#2). They are both located in stiffeners on the inside of the upper plate of the WPF. Fatigue cracks have occurred in both areas in a number of aircraft in the F-111 fleet operated by the RAAF. FFVH#13 is an area currently under analysis at AMRL. SRO#2 is an area formerly investigated by AMRL, but for which the opportunity to gain full-scale test data was still valuable.

Three rounds of testing were performed on an F-111 test wing, with the shapes of FFVH#13 and SRO#2 reworked between rounds, as done in service by the RAAF to remove cracks. The three sets of shapes are referred to as 'baseline', 'intermediate' and 'large' and covered the range of shapes in the RAAF F-111 fleet. The loading applied to the test wing simulated the cold proof test loading applied periodically to service aircraft.

FFVH#13 and SRO#2 are severe strain and stress concentrators. Under normal flight loading the stress at these locations exceeds the material yield stress and plastic strain occurs. The situation is even worse under cold proof load testing (CPLT) in which cycles of approximately positive and negative limit loading are applied to the wing. The plastic strains incurred during CPLT leave residual strains and stresses after CPLT is complete. It is these residual stresses which are the main driver of fatigue cracking at FFVH#13 and SRO#2, which otherwise experience a compression dominated loading spectrum, being in the upper plate of the wing. Therefore, a fatigue analysis of FFVH#13 requires a knowledge of both the cyclic flight load stresses and the residual stresses after CPLT.

The RAAF requires a durability and damage tolerance analysis (DADTA) to be performed on FFVH#13 taking full account of the residual stresses from CPLT and the range of shapes of the RAAF fleet. The DADTA will provide the basis for setting a safe inspection interval for FFVH#13 for ongoing RAAF operations. While the DADTA will be conducted by the OEM (Lockheed Martin) under a RAAF contract, AMRL was tasked by the RAAF to provide the input stresses, both the cyclic flight load stresses and the residual stresses after CPLT. AMRL approached this task by performing a detailed elastic/plastic finite element (FE) analysis of the FFVH#13 region. The full-scale wing tests described in this report were used to calibrate the FE model of FFVH#13 by providing comprehensive strain data to compare with the model output.

The interaction of residual stress/strain states (after cyclic plasticity from CPLT loading) and material removal (during reworking) made interpretation of the strain versus load behaviour from these tests quite difficult. The difficulty was compounded by an overriding bi-linear elastic structural behaviour of the WPF and complex structural behaviour of the shear web in the WPF. However, a good understanding of the material and structural behaviour of the wing pivot fitting has been gained and a comprehensive strain versus load data base has been established.

Author

Kevin C. Watters
Airframes and Engines Division

Mr Watters graduated from the University of Sydney in 1973 with a Bachelor of Engineering (Aeronautical) degree. He obtained a Master of Engineering Science degree from Melbourne University in 1981. Mr Watters worked at the Royal Australian Air Force (RAAF) Aircraft Research and Development Unit (ARDU) as a Flight Trials Engineer from 1973 to 1977. He then joined AMRL where he has worked for 20 years in the areas of vulnerability and lethality studies, experimental stress analysis and structural testing. Mr Watters is currently Head of Structural Testing in AED.

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1. Introduction

This report describes a series of full-scale static strain surveys of two critical areas in the wing pivot fitting (WPF) of the F-111 aircraft wing. The two areas are fuel flow vent hole number 13 (FFVH#13) and stiffener runout number 2 (SRO#2). They are both located in stiffeners on the inside of the D6ac steel upper plate of the WPF as shown in Figure 1. Fatigue cracks have occurred in both areas in a number of aircraft in the F-111 fleet operated by the Royal Australian Air Force (RAAF). FFVH#13 is an area currently under analysis at AMRL. SRO#2 is an area formerly investigated by AMRL [1], but for which the opportunity to gain full-scale test data was still valuable.

Three rounds of testing were performed on an F-111 test wing, with the shapes of FFVH#13 and SRO#2 reworked between rounds as described in Section 4. The three sets of shapes are referred to as 'baseline', 'intermediate' and 'large', corresponding to rounds 1, 2 and 3 of testing respectively, and were intended to cover the range of shapes in the RAAF F-111 fleet (Section 2).

An ex-United States Air Force (USAF) right hand wing was used as the test article and it was extensively instrumented with strain gauges in and around the critical areas (FFVH#13 and SRO#2). The test article and instrumentation are described in more detail in Sections 4 and 5 respectively. An existing test rig was used to support the test article and apply loads to it, although the rig was extensively modified for these tests to incorporate simulated wing sweep at a number of discrete angles (Section 6).

The loading distribution and cyclic increments are defined in Section 7 and were designed to mimic the loading in the cold proof load test (CPLT) (Section 2).

Aside from the strain gauges fitted to the vicinities of FFVH#13 and SRO#2, the whole WPF of the test article was extensively instrumented with a distributed array of strain gauges and with a concentration of gauges around the shear ring area. An array of displacement transducers was also fitted to the WPF. This additional instrumentation was to provide strain data to Lockheed Martin Tactical Aircraft Systems (LMTAS)[1] for it to calibrate a finite element (FE) model of the wing pivot fitting and to specifically investigate the shear ring area. This arrangement was part of an informal collaborative agreement between the RAAF and the USAF, with the USAF contracting LMTAS to produce the WPF FE model and the RAAF tasking AMRL to provide the strain data to calibrate the model. Under the agreement AMRL will have access to the WPF model produced by LMTAS.

[1] LMTAS is the original manufacturer of the F-111. It was formerly named General Dynamics and then Lockheed Fort Worth Company before its current name.

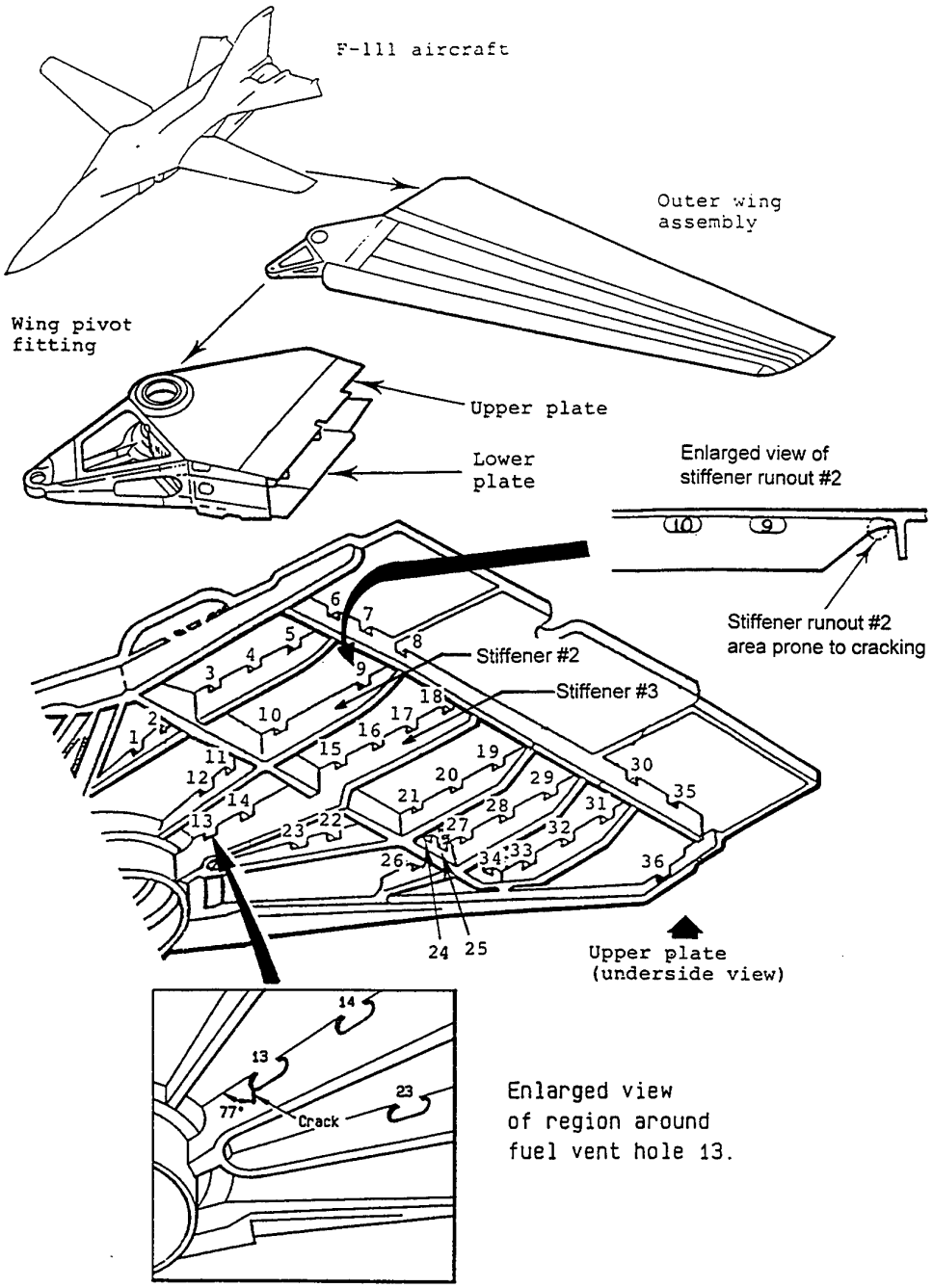

Figure 1: F-111 Wing Pivot Fitting - FFVH#13 and SRO#2 Locations

The data collected from the gauges other than the strain gauges around FFVH#13 and SRO#2 are not presented in this report. They are presented in Reference 2. Furthermore, in the first round of testing of the baseline shape, twelve load cases to lower load levels than peak cold proof load test levels were performed prior to the full

CPLT simulation load cases. These were to establish a strain data base prior to risking the test article to full CPLT loads, and were largely for the benefit of LMTAS and future RAAF needs rather than to address the current interest in FFVH#13 and SRO#2. Therefore, those load cases are reported in Reference 2, and are only briefly referred to in this report for their impact on the prior history of FFVH#13 and SRO#2.

This report (and Reference 2) are complemented by AED Laboratory Reports (References 3, 4 and 5) in which the conduct of the three rounds of testing and the data obtained from them are reported in significant detail. The data presentation in this report is limited to tabulations of complete data from critical gauges, tabulations of zero and peak data from other relevant gauges and plots of strain histories and strain distributions. Some of the gauges exhibit unusual and complex strain versus load behaviour and possible explanations for this are presented. The influence of the reworks of FFVH#13 and SRO#2 in changing the shape and peak value of strain distributions around them is discussed.

2. Background

2.1 Management of In-Service Cracking

Fatigue cracks have been detected at the lower inboard corner of FFVH#13 in a number of the RAAF F-111 aircraft [6, 7]. When fatigue cracks are detected at FFVH#13 by the RAAF they are removed by cutting out sections of material containing them using the electro discharge machining (EDM) process. In doing so, the holes are purposefully reshaped to provide a larger radius at the critical corner to minimise the stress concentration and the propensity for re-cracking. The RAAF uses the family of rework shapes shown in Figure 2, which were previously developed by AMRL [8]. The minimum size rework that will remove the crack is selected and interpolation between the shapes shown in Figure 2 is permitted.

Prior to adopting the rework shapes shown in Figure 2, the RAAF exercised less control over rework shapes and generally small circular arc cutouts were performed, creating a bulbous corner to the hole where the crack had been. Furthermore, the RAAF implements a 'confidence cutting' process around the entire perimeter of FFVH#13 when a crack is not detected in a routine inspection. This is a hand-applied abrasion process using emery paper and is aimed at removing a 0.005 in (0.127 mm) layer of material. It cannot be applied with precision and generally results in progressive distortion of the shape of the hole after a number of inspections. This same process is also applied to the perimeter of a freshly reworked hole to remove the heat affected zone left by the EDM process. The net result is that there is a range of shapes and sizes of FFVH#13s in the RAAF fleet, although over time the fleet will come to fit in with the family of shapes shown in Figure 2, but with some distortions due to the hand abrasion work.

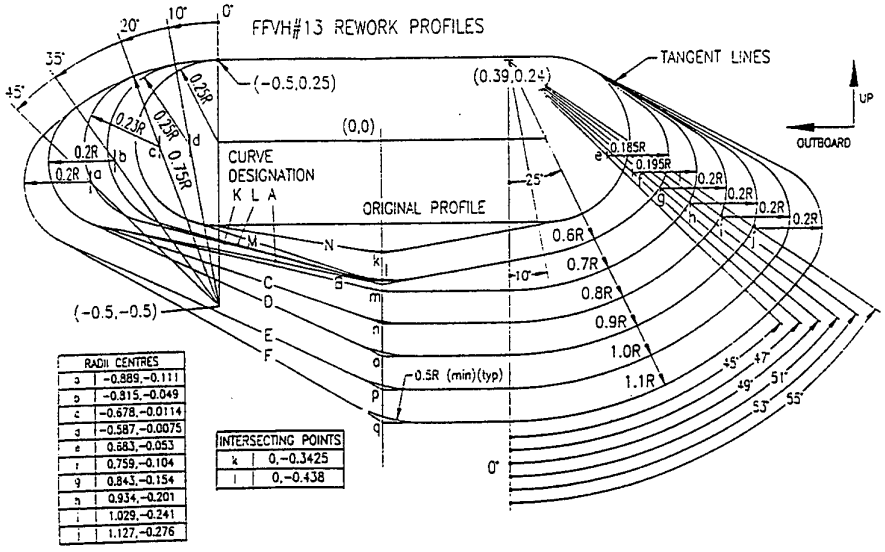

Figure 2: FFVH#13 Rework Shapes

Stiffener runout number 2, like FFVH#13 had a history of fatigue cracks being detected in service in the RAAF fleet [6, 9]. That problem has largely been fixed by an AMRL-developed boron/epoxy doubler reinforcement which has been fitted to the RAAF fleet [10, 11]. The effectiveness of the doubler has been confirmed in the most recent durability and damage tolerance analysis (DADTA) performed on that location. Inspection intervals for SRO#2 are now sufficiently long to be easily accommodated in the periodic depot maintenance program. However, SRO#2s in the RAAF F-111 fleet still exist in a range of shapes [9] because of the crack removal actions prior to doubler fitment, which were not done to any prescribed shape or family of shapes. Reworks to remove cracks were generally done using a circular arc cutout, with a judgement on best radius in relation to depth of cut necessary to remove the crack. In addition, confidence cutting was, and still is applied to SRO#2, just as for FFVH#13, and further serves to vary the fleet range of shapes.

2.2 Cause of the Cracking

FFVH#13 acts as a very severe strain and stress concentrator. Under normal flight loading the stress at two locations around the perimeter of FFVH#13 exceeds the material yield stress and plastic strain occurs. The two locations are the lower inboard corner, where in-service cracking has occurred, and the diagonally opposite upper outboard corner, which is less severe and has not been the site of in-service cracking. The situation is even worse under cold proof load testing[2] in which cycles of

[2] Cold proof load testing (CPLT) is a periodic proof load testing program performed in a special facility on the F-111 structure to confirm the absence of any flaws above a very small size. It then clears the aircraft for a further period of safe flight. In CPLT the aircraft is cooled to -40°F (-40°C) to embrittle the D6ac steel structure and then load cycles of -2.4 *g* and +7.33 *g* at 56° wing sweep angle and -3.0 *g* and +7.33 *g* at 26° wing sweep angle are applied to it.

approximately positive and negative limit loading are applied to the wing. The strain concentration factor at the lower inboard corner of FFVH#13 during CPLT is of the order of 5. The plastic strains incurred during CPLT leave residual strains and stresses after CPLT is complete. It is these residual stresses, which are tensile, that are the main driver of fatigue cracking at FFVH#13, which otherwise experiences a compression dominated loading spectrum, being in the upper plate of the wing. Therefore, a fatigue analysis of FFVH#13 requires a knowledge of both the cyclic flight load stresses and the residual stresses after CPLT.

2.3 Previous Strain Surveys

Previous strain surveys have been conducted on the F-111 WPF [12 to 21] mainly associated with the development of the boron/epoxy bonded doublers. The strain surveys in [12, 13, 18, 20] were on wings without the doublers fitted, and are therefore comparable to a limited extent to the tests described in this report. The strain surveys in [12 to 21] were principally focussed on SRO#2 and the other stiffener runouts for which the doublers were developed. Their data on FFVH#13 are therefore limited. The exception was the strain surveys in [15] which were specifically focussed on FFVH#13 and included a baseline shaped hole and a reworked hole to shape B in Figure 2, but the loads were limited to 80% of CPLT loads.

The doublers were fitted for the strain surveys in [15] but they have little influence on FFVH#13 and so the strain data from that reference should be comparable to the FFVH#13 data of this report. The data from the SRO#2 region of the WPF for strain surveys conducted on wings with the doublers fitted are not comparable with the relevant data in this report because of the profound influence of the doublers in that region. See [10] for an excellent summary of the development of the boron doublers and the associated tests.

The current series of surveys reported here have been targeted in more detail at FFVH#13 and are the first to investigate on a full-scale test article and through a full CPLT load cycle the effect of reworks to FFVH#13 and SRO#2. Reworks of SRO#2 were previously investigated [22] on a representative specimen using a qualitative full-field stress measurement technique. A representative specimen of FFVH#13 was developed for investigation of a plug reinforcement [23], and was subsequently used to investigate reworks to FFVH#13 [24].

D6ac steel structure and then load cycles of -2.4 *g* and +7.33 *g* at 56° wing sweep angle and -3.0 *g* and +7.33 *g* at 26° wing sweep angle are applied to it.

3. Aim of the Tests

The RAAF requires a DADTA to be performed on both the lower inboard and upper outboard corners of FFVH#13 taking full account of the residual stresses from CPLT and the range of shapes of the RAAF fleet. The DADTA will provide the basis for setting a safe inspection interval for FFVH#13 for ongoing RAAF operations. While the DADTA will be conducted by LMTAS under a RAAF contract, AMRL was tasked by the RAAF to provide the input stresses, both the cyclic flight load stresses and the residual stresses after CPLT. AMRL approached this task by performing a detailed elastic/plastic finite element (FE) analysis of the FFVH#13 region [25]. The full-scale wing tests described in this report were used to calibrate the FE model of FFVH#13 by providing comprehensive strain data to compare with the model output.

The primary aim of the tests (aside from the collaboration with LMTAS) was to provide strain versus load data at the critical locations around FFVH#13 and in the vicinity of FFVH#13, including nearby 'far-field' strains. The data were required for three shapes of FFVH#13, baseline, intermediate and large, to compare with three separate FE models incorporating those same shapes. A secondary aim of the tests was to provide similar strain data for SRO#2, again for three shapes. Those data were not intended for immediate further use but could be used to confirm previous FE predictions [1, 10, 26].

Since residual strains after a series of load cycles in CPLT were of interest, it was deemed important to track the history of strain changes during each round of the tests. For each round of testing, strains were referred to the pre-test condition of the test wing as being in a zero strain state at all locations[3]. This was done by taking an initial zero in an unloaded condition and using that as an ongoing reference. The strains so recorded are referred to as 'absolute' strains, as opposed to the 'delta' strains from any load cycle which refer to the initial condition of that cycle as zero.

4. Test Article

4.1 General Description and History

The test article was an F-111A right hand wing (part no. 121V027-878, serial no. A10-824), previously supplied to AMRL by the USAF. The test wing was structurally complete and had not sustained any physical damage. The control surfaces were not included with the wing. Prior to an earlier test series on the wing at AMRL, the wing

[3] This was the only practicable approach because the reworking between rounds removed some or all of the previously yielded material at the rework location and the gauges had to be removed and refitted for the rework process. For gauges unaffected by the rework, the strain behaviour was generally elastic and it was not needed to keep track of absolute strain changes through the three rounds of testing.

sweep actuator attachment frame had been cut off in order to fit the wing into the test rig. The test wing is shown mounted in the test rig in Figure 3.

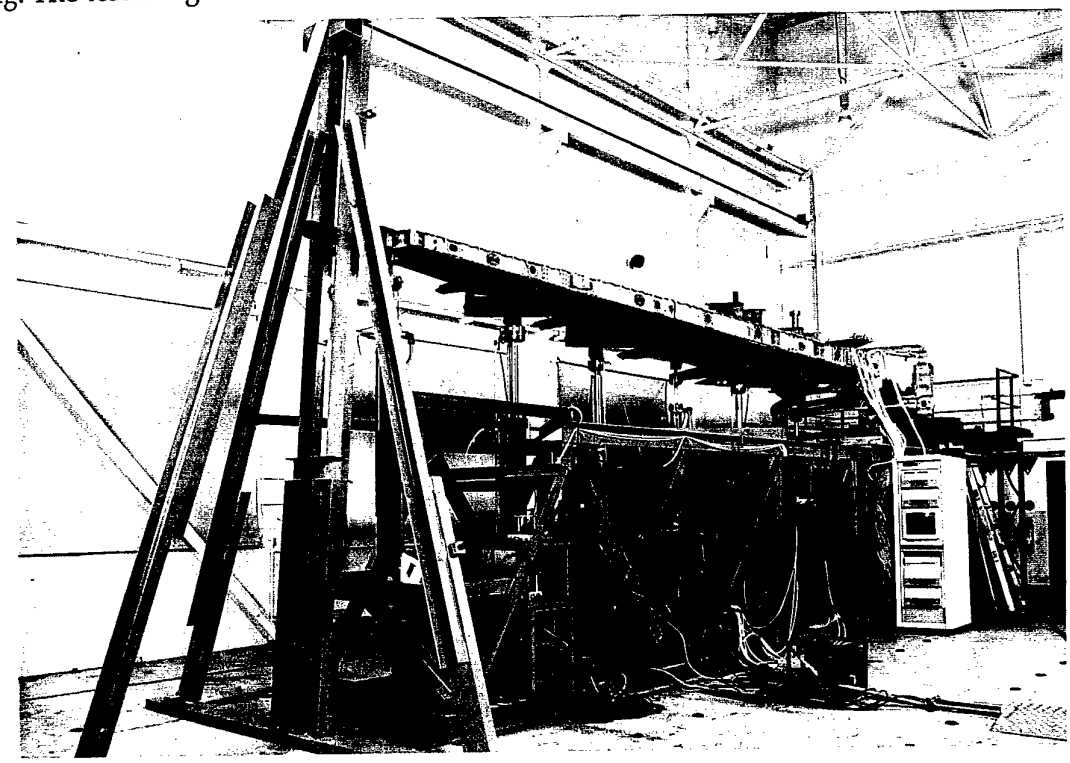

Figure 3: The F-111 Test Wing Mounted in the Rig

Drawings of the wing pivot fitting structural elements are shown as attachments in Appendix A. The wing pivot fitting structural elements were made of high strength D6ac steel except for the internal titanium shear web. This shear web runs spanwise and depthwise through the wing pivot fitting and is attached to stiffener #3 in which FFVH#13 is located. It contributes shear stresses to FFVH#13 in addition to the plate bending stresses. The attached drawings in Appendix A show the structural arrangement of the internal shear web.

Unfortunately, the history of the test wing before coming to AMRL is largely unknown. Prior to this series of tests, two other series of tests had been performed on this wing at AMRL. The first series of tests was conducted in June 1993 and included loading to 60% of maximum CPLT levels in both positive and negative directions. In all, ten load cases[4] were applied to this level. The second prior test series was conducted in June 1994 and comprised eight load cases with varied load distributions. Referencing these load cases to CPLT wing root bending moment, four were conducted to +45%, three were to +50% and one was to -100% (of the -2.4 *g* CPLT case).

[4] Throughout this report a load case is defined as the application of one load cycle in increments from zero up to a maximum (or down to a minimum) and back to zero.

As part of this test series, but not reported here (see Reference 2), twelve combined load cases and many single actuator load cases were applied to the test wing prior to the baseline CPLT load cases. The combined load cases were all to ±60% of CPLT loads at a range of wing sweep angles, and the single actuator cases were to significantly less equivalent loads. The last two of these load cases were combined load cases to -60% CPLT at 26° wing sweep.

It would be prohibitively difficult to try to track the material state changes through all this prior AMRL test loading, and would be pointless given the lack of knowledge of the wing's history prior to being obtained by AMRL. All of the prior AMRL test loading was within the range of normal flight loads (except perhaps the -2.4 *g* case mentioned above), and it can be concluded that the test wing was in typical in-service state leading into the tests described in this report. Nonetheless, two points are noteworthy. Firstly, the immediate prior loading to -60% would have biased the lead-in material state. Secondly, the strain gauges for the baseline round of tests were zeroed before the prior twelve combined load cases and single actuator load cases, and so some of the gauge data presented in this report, particularly for gauges at high stress locations, will show significant initial values.

4.2 Preparation

Prior to the first round of tests the structural assembly of the wing was checked by a licensed airframe fitter against the requirements of the current issue of the RAAF Structural Repair Manual (SRM). All loose bolts and removable panels were checked, replaced as necessary and tightened to the prescribed torque.

4.3 Reworking

The nominal shapes intended for test are shown in Figure 2 for FFVH#13 and Figure 4 for SRO#2. For FFVH#13, the baseline test shape was nominally the blueprint inner shape shown in Figure 2, the intermediate test shape was shape C and the large test shape was shape F. These shapes cover the range of shapes in the RAAF F-111 fleet [6, 9]. For SRO#2 (Figure 4), the smallest radius of 13 mm (0.52 in) represents the as-received condition of the test wing and was used for the baseline round of tests, the next largest radius of 15.2 mm (0.6 in) is the Structural Repair Manual recommended value and was used for the intermediate round of tests and the largest radius of 19.8 mm (0.78 in) represents the fleet average [9] and was used for the large round of tests.

The intermediate and large shapes of FFVH#13 were created by EDM machining using precision process control to produce an accurate shape with mirror surface finish [27]. A slight problem occurred in machining the large shape from the intermediate shape. At the upper outboard corner a slight ridge was left where the large shape blends into the intermediate shape. It was blended out using emery paper and was considered to have negligible residual effect on the overall large shape of FFVH#13.

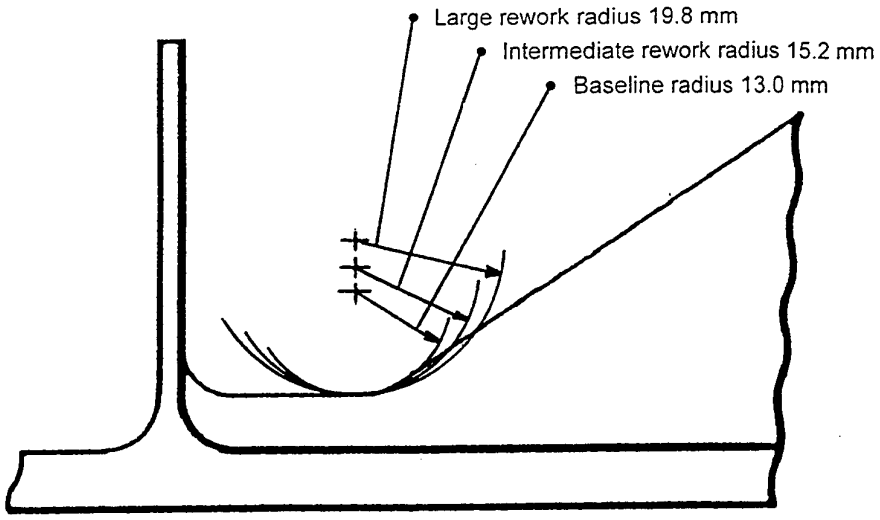

Figure 4: SRO#2 Rework Shapes

The intermediate and large shapes of SRO#2 were created using an air-driven hand-held grinding tool and checking the shape against a template as the grinding proceeded. This proved successful and accurate shapes were obtained.

4.4 Measurement

The first round of tests was performed with the wing essentially in the as-received condition as far as the shapes of SRO#2 and FFVH#13[5] are concerned. The shapes of SRO#2 and FFVH#13 were measured as part of each round of testing. This was done by taking moulds with dental impression material, taking casts from the moulds and performing digitised metrology of the casts. The shapes for the baseline round of tests are shown in Appendix A. The baseline shape of FFVH#13 was slightly different from the blueprint shape of Figure 2, being larger and having a slightly bulbous lower inboard corner, probably resulting from some in-service reworking. The shapes of FFVH#13 and SRO#2 for the intermediate and large rounds of tests were closely as prescribed in Figures 2 and 4 and the measurement data are not included in this report (but can be found in References 4 and 5).

5. Instrumentation

The instrumentation used in the tests (for the purposes of this report) was strain gauges fitted to the test wing and load cells used to measure the applied jack loads.

[5] FFVH#13 had been slightly modified for fitment of strain gauges for a prior test series. This involved hand abrasion to flatten the inner surface and had no effect on the overall shape of FFVH#13.

The strain gauges referred to in this report are a subset of the total strain gauge fitment to the test wing. Details of all the strain gauges fitted to the wing and rig and other instrumentation comprising displacement transducers and inclinometers can be found in References 2 to 5.

Between each round of tests some of the gauges around FFVH#13 and SRO#2 had to be removed for the rework process and then replaced after the reworking. The opportunity was taken to revise the gauge configuration based on the results of the previous round of testing and extra gauges were added to both FFVH#13 and SRO#2 and elsewhere in their vicinity. This resulted in there being three different sets of gauges for the baseline, intermediate and large tests. The three sets of strain gauges are listed in Appendix A and the locations of all the gauges are shown in Appendix A.

Four types of strain gauges were used: single element gauges, flat and stacked rosettes and strip gauges. The single element gauges had gauge lengths of either 1.59 mm (0.0625 in) or 3.18 mm (0.125 in). The flat rosettes consisted of three elements with a 0/45/90 degree configuration and all oriented to a common point. The flat rosette elements had gauge lengths of 6.35 mm (0.25 in). The stacked rosettes were also in the configuration 0/45/90 degrees but with overlaid elements of gauge length of 3 mm (0.118 in). The strip gauges comprised five elements of 1 mm (0.0394 in) gauge length and 2 mm (0.0788 in) pitch, with gauge axes parallel to the strip.

Loads were applied to the test article by servo-controlled hydraulic actuators. The locations of the actuators on the wing are shown in Figures 3 and 5. The applied loads were measured by load cells connected between the end of the actuator rod and the test article. The load cells were Interface brand with dual bridges, except for load cell E in the baseline round of tests which was single-bridge. A typical actuator and load cell installation is shown in Figure 6.

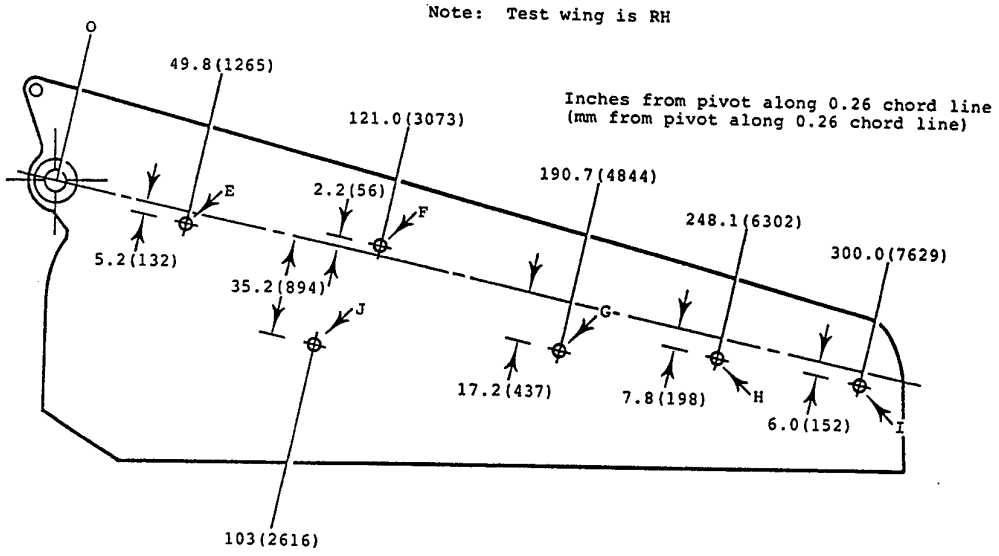

Figure 5: F-111 Wing Test Actuator Locations

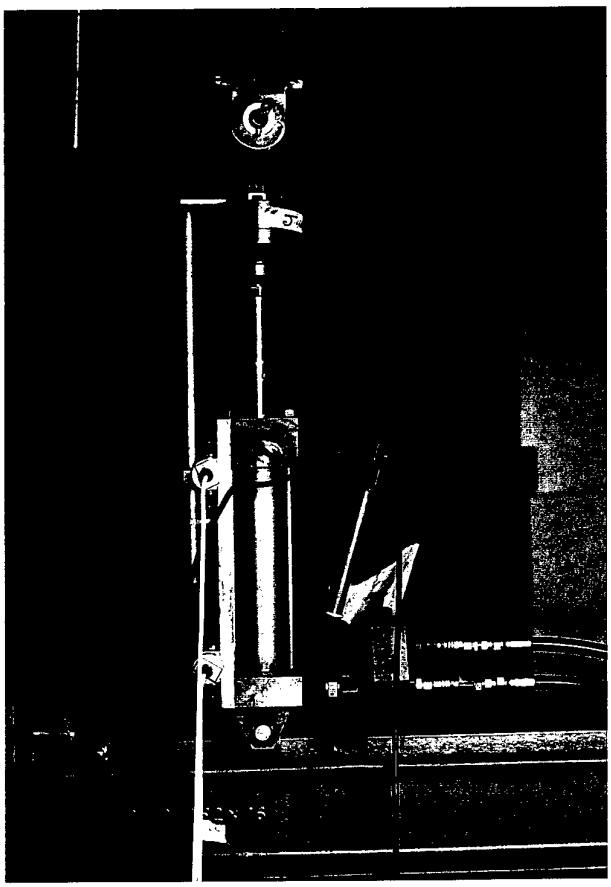

Figure 6: Typical Actuator and Load Cell Assembly

6. Test Rig

The test wing was attached to a wing carry through box (WCTB) in the same manner as in the actual aircraft installation, except that the wing sweep actuator attachment frame had been removed from the wing, and so, that connection was not represented[6]. The WCTB was in turn attached to the steel truss test rig structure via two heavy frames and associated attachment lugs (see Figure 7). This bolted lug connection allowed the WCTB to be attached in either of four angular locations to simulate wing sweep angles of 16°, 26°, 44° and 56°. A more complete description of the test rig is given in Reference 2.

[6] Absence of the wing sweep actuator connection should not significantly affect the strains in the WPF for CPLT loading which is normal to the wing.

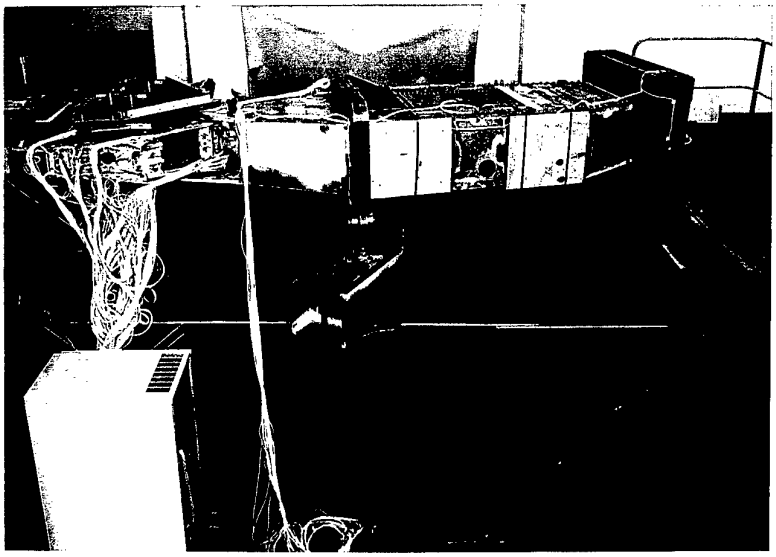

Figure 7: Wing Carry Through Box Mounting

7. Loading

7.1 Zeroing Procedure

For each round of testing (baseline, intermediate and large), a reference zero reading was taken from all the strain gauges prior to the application of any load cases. This zero reference was taken with the test wing in effectively a zero applied strain state. The reference was kept through all the load cases, and the strain readings are referred to as absolute values. As part of each load case, a reading of all transducers at zero applied load was taken at the start and finish, but these readings were not used to reset values to zero.

The zero strain reference state was achieved by applying upward load from actuator F (nearest to the wing CG) and monitoring the wing tip displacement by a transducer, and then selecting the midpoint of the dead band of the load versus displacement plot when the wing pivot pin backlash caused the deflection to change without load increase. At that point all load had been taken off the wing pivot pin and the dead weight of the wing was deemed to be fully supported by actuator F. The strain gauges were zeroed in this condition which approximated to an absolute zero strain state, ignoring any built-in or residual strains. Then actuator F was unloaded to zero and a reading was taken from all the strain gauges to quantify the test wing dead-weight strains.

7.2 CPLT Sequence

The CPLT sequence comprises aircraft limit load cycles of -2.4 *g* and +7.33 *g* at 56° wing sweep followed by -3.0 *g* and +7.33 *g* at 26° wing sweep, related to a specific aircraft configuration [28]. These are referred to in this report as load cases 1 to 4 respectively. To apply these loading conditions to the wing, the actuator arrangement shown in Figure 5 was used (identical to that used in the actual CPLT facility at Sacramento Air Logistics Center in the US). Corresponding to the overall aircraft loading conditions, the individual actuator peak loads are listed in Table 1, which also includes the wing root shear, bending moment, and torque produced by those loads. The sign convention for loads and shear is positive upwards, for bending moment is positive with upwards wing bending and for torque is positive with leading edge upwards wing twist.

Table 1: F-111 Wing Test Loading

Case No.	Dir'n	Actuator Loads						Wing Root Loads		
		E (kN)	F (kN)	G (kN)	H (kN)	I (kN)	J (kN)	Shear (kN)	WRBM (kN.m)	Torque (kN.m)
1	-	-138.22	0.00	0.00	-104.56	0.00	0.00	-242.78	-833.79	38.95
2	+	103.36	131.98	125.15	131.98	20.50	31.60	544.57	2 213.17	-118.44
3	-	-126.11	-72.81	0.00	-104.56	0.00	0.00	-303.48	-1 042.21	33.27
4	+	103.36	131.98	125.15	131.98	20.50	31.60	544.57	2 213.17	-118.44

The CPLT sequence required a specific schedule of load increments and that schedule was closely adhered to in these tests. The schedule for each of the four load cases required load increments of 0%, 10%, 20%, ..., 100%, 80%, 50%, 20%, 10%, 20%, 0%, with no longer than 30 seconds hold at 100% and no longer than 3 minutes spent above 80%. Data were acquired from all strain gauges and load cells at each increment.

The tests were performed in an uncontrolled laboratory environment with ambient temperatures in the range 18°C to 25°C (64°F to 77°F). This differs from the normal CPLT environment of -40°C (-40°F) but was suitable for the aims of these tests, which were to conduct surveys of the strains induced by CPLT loads, rather than to qualify the wing against a proof condition. The premise was that the strains induced in a room temperature environment are virtually the same as those induced in a -40°C environment (as indicated in [21]). However, there is evidence in previous strain surveys in which a direct comparison of ambient temperature results with -40°C results is possible [16&17, 18&19, 21] that some of the high strain locations exhibit 5% to 12% less strain at the lower temperature and the difference is constant through the load range.

8. Test Equipment

Aside from the test rig structure and mechanical/hydraulic hardware described in Section 6, the test equipment comprised a control system for the actuators and data acquisition equipment for the strain gauges and load cells. The control system comprised Cyber FM 7000 digital-analogue hybrid control modules coupled to a PC incorporating in-house developed control software called ISGAR. The data acquisition equipment comprised a number of independent HP systems, including HP75000 and HP VXI systems. A different arrangement of data acquisition systems was used for each of the three rounds of testing because of the availability of equipment at the time of each round and the total number of channels required for each round. See Reference 2 for a more complete description of the data acquisition equipment.

9. Test Sequence and Events

9.1 General Test Procedure

Prior to the application of the load cases for each round of testing, some preliminary runs to small load levels were performed to commission the rig control and data acquisition systems and to check the data from the strain gauges. The maximum load in such tests was not greater than 40% of the maximum upload. After the test equipment had been successfully commissioned, the zeroing procedure was carried out on the strain gauges, followed by the application of the load cases relevant to the round of testing. Figure 8 shows the typical deflection of the test wing at +7.33 *g*. The events of the three rounds of testing were different and are described individually below.

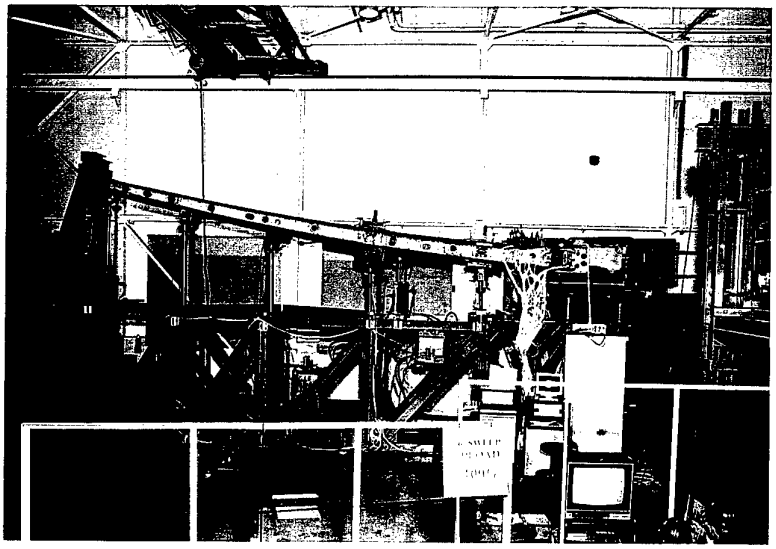

Figure 8: F-111 Test Wing Deflection at +7.33 g Load at 56° Wing Sweep

9.2 Baseline Tests

As noted in Section 4, twelve combined load cases and many single actuator load cases were applied to the test wing prior to the baseline CPLT load cases. This took place after the zeroing of the strain gauges. The combined load cases were all to ±60% of CPLT loads at a range of wing sweep angles and the single actuator cases were to significantly less equivalent loads. The last two of these load cases were combined load cases to -60% CPLT at 26° wing sweep.

The first baseline CPLT downloading case to -2.4 *g* at 56° was applied without incident. However, in the next load case to +7.33 *g* at 56° a microswitch was tripped after the 70% load increment and load was automatically dumped. This load case was then repeated after removing the microswitch. At 100% load increment of this repeat run there was a loud 'bang' noise which, on later examination, was found to be caused by seven bolts failing in the WCTB. These bolt failures did not cause the load case to be disrupted, as the test wing and the WCTB continued to sustain the load, and the load case proceeded and was completed successfully.

Next, (after the failed bolts had been replaced) the wing sweep angle was changed from 56° to 26° and the -3.0 *g* load case was applied without incident. Subsequently, the +7.33 *g* at 26° sweep load case was applied seemingly successfully, but it was discovered later that actuator 'I' had been wrongly scaled for that case and did not apply any load. This erroneous load case was designated load case X and reached a maximum wing root bending moment (WRBM) of only 92.8% of the maximum CPLT WRBM. This load case was then repeated with the scaling of actuator 'I' rectified, and was completed successfully without further incident.

9.3 Intermediate Tests

The test rig commissioning runs performed prior to the CPLT tests were to +40% CPLT load. A total of five such runs were performed. The zeroing procedure and the four CPLT load cases were then applied successfully without any significant incidents.

9.4 Large Tests

The test rig commissioning runs performed prior to the CPLT tests comprised a total of four runs to +30% CPLT load. The responses of all gauges in the 30% runs, including the gauges at the peak of stress concentrators, were linear elastic and with no residual effect on the absolute strains. This is because the strains were all below the yield strain and the uploading direction of these 30% runs was the same as for the final +7.33g run from the previous intermediate round of testing.

After the fourth 30% commissioning run, the zeroing procedure for the strain gauges was performed successfully and the zero reference created for the strains was retained throughout the subsequent testing. The four CPLT load cases were applied successfully and without significant incident.

During load case 2 to +7.33 *g* at 56° wing sweep, a lead connecting load cell H to the data acquisition system became caught in the rig structure, causing it to become disconnected from the load cell. Therefore, some data were not directly recorded from this load cell, but the load was monitored by the ISGAR/CYBER control system and recorded manually. These manually recorded data were inserted in the data file after the test to substitute for the unrecorded data.

Due to a data acquisition system set-up error, the wrong strain data were sent to a data file during load case 2 and the data from the 20 gauges that should have been recorded in that file were lost. Those data were on the shear web and not in the immediate vicinity of FFVH#13 or SRO#2, and so the loss has little significance for this report.

10. Results

The strain gauge and load cell readings from the three rounds of tests are presented in tables in Appendix B. Loads are presented in kiloNewton units and strains are presented in microstrain units. For the load cells and for the strain gauges around the perimeter of FFVH#13 (gauges 72, 259, 258, 300, 301, 302, 303, 73 & 260), FFVH#14 (gauges 75 & 76) and SRO#2 (gauges 59/60, 359/360 & 36/37) the full histories of readings at each load increment of the CPLT cycle for the three rounds of testing are listed. For all the other gauges only the zero and 100% values for each load case in the CPLT cycle of the three rounds of testing are listed. The difference between the initial zero and the 100% reading of a load case is also shown as a 'delta' value.

The peak strains measured around FFVH#13 and the adjacent FFVH#14 and SRO#2 have been extracted from Appendix B and are listed in Table 2. Note that the shape of FFVH#14 was not modified between configurations but the strains around FFVH#14 were affected by the modifications to FFVH#13.

Table 2: Peak Strains

Location	Peak Strain (με) at +7.33 *g* and (Gauge ID)		
	Baseline Configuration	Intermediate Configuration	Large Configuration
FFVH#13 lower inboard corner	-21 651 (72_3)	-18 923 (258_1)	-17 555 (300_5)
FFVH#13 upper outboard corner	-12 366 (73_2)	-15 085 (73_5)	-14 232 (73_4)
FFVH#14 lower inboard corner	-13 661 (75_3)	-13 681 (75_3)	-13 254 (75_3)
FFVH#14 upper outboard corner	-9 280 (76_1)	-9 555 (76_2)	-9 310 (76_2)
SRO#2 inside	-15 339 (59/60_3)	-11 647 (59/60_5)	-12 939 (359/360_1)

Because the strain gauges remained fitted to FFVH#14 through the three configurations, it should have been possible to correct for the re-zeroing of the gauges at the start of each configuration by adding in the residuals from the previous configuration. However, the opportunity was missed on the baseline configuration because two load cases were applied after the CPLT loads [3] and the FFVH#14 gauges were not monitored during them. The residuals at FFVH#14 after the baseline tests would have been affected to an unknown but significant extent by those two extra load cases. Given the loss of that continuity, no attempt has been made to adjust the intermediate and large configuration data from FFVH#14. Such an adjustment would not have been large, say ~ 500 με on the peak strains, and would not have significantly changed the magnitudes or trends of the FFVH#14 data in Table 2.

Plots of the test data are presented in Appendix C. Two types of plot are presented. The first type of plot is the history of strain versus load for a single gauge element over the full CPLT cycle of one round of testing. These are referred to as 'strain history plots'. The second type of plot is the strain versus location for a collection of contiguous gauges. Data at 0% and 100% load for a number of load cases are typically shown together on the one plot. These are referred to as 'strain distribution plots'. It should be noted that load shown in both types of plots is the nominal percentage load level of the increment rather than the actual load readings. This was done for simplicity and is justified by the close agreement between the measured and nominal loads. The plots in Appendix C are described and discussed in Section 11.

11. Discussion of Results

11.1 FFVH#13 Lower Inboard Corner

The strain distribution plots around the lower inboard corner of FFVH#13 are shown in Figures C1 to C3 of Appendix C for the baseline, intermediate and large configurations respectively. They show very large peak strains under the +7.33 *g* load case ranging up to -21 651 με, well in excess of the nominal compressive yield strain of -7 200 με for the D6ac material. An interesting feature of the results from all three configurations is that the second +7.33 *g* load case gave almost identical peak and residual strains as the first +7.33 *g* load case. This shows that the strains at FFVH#13 were not influenced by the change in sweep angle from 56° to 26° and that the plastic strain versus load behaviour stabilised after just one cycle.

The maximum-load and residual strain distributions from the final +7.33 *g* load case are compared in Figure C4 for the three configurations. In conjunction with Table 2 it shows that reworking from baseline to intermediate to large configurations does progressively reduce the peak strain from -21 651 με for the baseline configuration to -17 555 με for the large configuration. The peak value for the intermediate configuration may not have been captured by the strain gauge placements but is likely to have been near the largest measured value of -18 923 με. These strain levels and the

strain reductions achieved by the reworks are in good accordance with the data in [15] which were from 80% CPLT load level surveys of a baseline shape and a shape B from Figure 2. Table 3 shows the comparable strains.

Table 3: FFVH#13 Peak Strain Comparison with Earlier Data

Shape	Delta Strain (microstrain) 0% to 80% of +7.33 *g*	
	Current Data	Ref. 15 Data
Baseline	-15 090	-14 809
Shape B		-13 654
Shape C	-12 749	
Shape F	-11 718	

An interesting feature of Figure C4 is that the residual strains from the baseline configuration are less than those from the intermediate and large configurations, even though the strains at +7.33 *g* load were larger. This is attributed to there being some residual stress/strain/plastic deformation state around FFVH#13 prior to fitment of gauges for the baseline tests. This residual state came from the prior loading of the wing at AMRL and from its prior service. Such a residual state was not present for the intermediate and large configurations because the rework removed the plastically deformed material and then fresh gauges were fitted. It may be assumed that without this prior residual state the peak strain at +7.33 *g* load for the baseline configuration would have been higher than the -21 651 με value recorded. Figure 9 shows the material removed during reworking from baseline to intermediate and intermediate to large configurations. Also marked on Figure 9 are the locations of the measured peak strains and the estimated plastic zone sizes[7] for the three configurations to show the relevance of the material removal on material state at the peak strain locations.

[7] These plastic zone sizes and shapes were obtained from Reference 25 from stress contour plots from elastic FE analyses as the contour for which the elastic stress is higher than the yield stress. The baseline contour was actually obtained from the blueprint analysis and slightly scaled up. The contours at the upper outboard corner have been smoothed from those in Reference 25 which were artificially jagged due to mesh thickness changes. All the yield zones in Figure 9 are therefore indicative only.

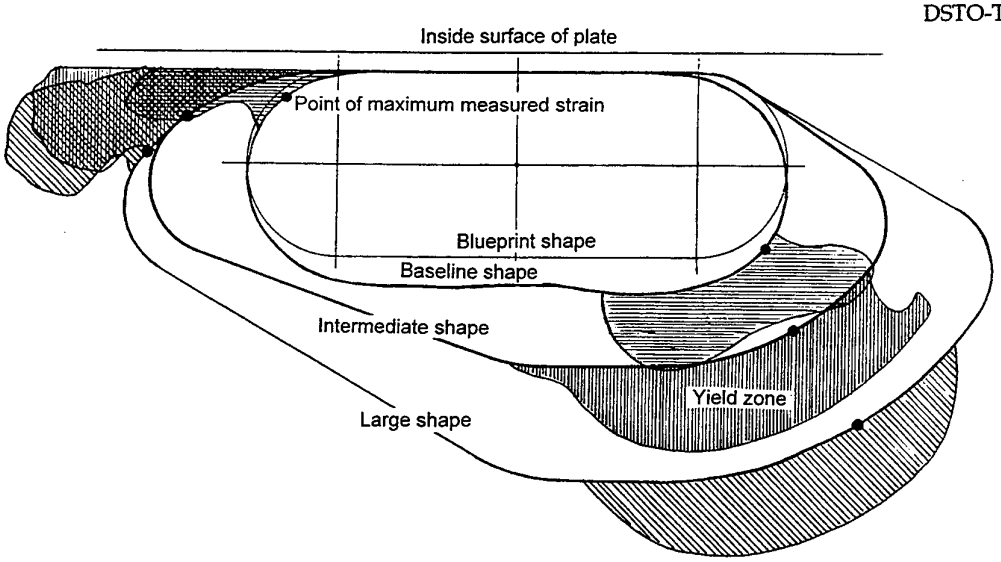

Figure 9: Yielding and Reworks around FFVH#13

The influence of a prior residual state on the baseline configuration behaviour should not be confused with the fact that the zero load strains prior to load case 1 were significantly non-zero. That situation was caused by the twelve load cases applied to the baseline configuration after the zeroing of the strain gauges and before the CPLT load cases (Sections 4.1 and 9.2).

Another interesting feature, most evident in the large configuration strains, is the influence of the residual state from the first +7.33 *g* load case on the maximum strains from the following -3.0 *g* load case. Figure C3 shows a significant dip in the maximum strain distribution for the -3.0 *g* load case 3 compared to the -2.4 *g* load case 1.

Figures C5 to C7 are strain histories from the gauges at the peak strain locations at the lower inboard corner of FFVH#13 for the baseline, intermediate and large configurations respectively. These plots confirm the behaviour discussed in the preceding paragraphs. They show the strain versus load hysteresis loop caused by the plasticity at this location. The discontinuity in Figure C5 between the zero load strain after load case 3 and the zero load strain before load case 5 is caused by the erroneous load case X for which the results have not been plotted.

11.2 FFVH#13 Upper Outboard Corner

The behaviour at the upper outboard corner of FFVH#13 was similar to that at the lower inboard corner but the strain levels achieved were lower. Figures C8 to C10 show the strain distributions at this location for all load cases of the three configurations. Figure C11 shows a comparison of the strain distributions for the final +7.33 *g* load case for the three configurations. Figures C12 to C14 show the histories of the peak strains for the three configurations. Gauge 78_5 behaved erratically for the final +7.33 *g* load case (Figure C8) and that portion of the data can be ignored.

From Table 2 the peak strains recorded at the upper outboard corner of FFVH#13 were -12 366 με for the baseline configuration, -15 085 με for the intermediate configuration and -14 232 με for the large configuration. This result is in general accordance with previous strain data [15] and previous FE analyses [8, 25] which predicted an increase in the strain at the upper outboard corner due to the reworks. As for the lower inboard corner, the peak value for the baseline configuration may have been influenced by an unknown residual state from service and test loading prior to this series of tests. Certainly, the strain history from the gauge at the peak strain location for the baseline configuration (Figure C12) shows considerably less hysteresis than the comparable histories from the intermediate and large configurations (Figures C13 and C14).

The influence of material removal during rework on the initial stress/strain states for the intermediate and large configurations can be derived from Figure 9. That figure shows that a considerable amount of material was removed from the upper outboard corner during the rework from the baseline to the intermediate configuration but little further material was removed during the rework from the intermediate to the large configuration. The peak strain location from the intermediate configuration is seen to be just on the edge of the plastic zone created by the loading of the baseline configuration and, likewise, the peak strain location from the large configuration is seen to be just on the edge of the plastic zone created by the loading of the intermediate configuration, despite only little local material removal in this latter case. Therefore, the peak strains for the intermediate and large configurations have occurred at locations of previously unyielded material and this is consistent with the strain versus load behaviour in Figures C13 and C14 where load case 1 is seen to be linear elastic and the overall CPLT cycle has considerable hysteresis. The trend for the peak strain location to move away from the plate as the hole is reworked is in agreement with FE predictions [8] but is opposite to the trend noted in [15] of previous data.

Figures C15 and C16 are strain history plots from gauges 73_3 and 73_2 for the large configuration. Gauge 73_2 was at a location corresponding to that of gauge 73_5 for the intermediate configuration, while gauge 73_3 did not have a corresponding intermediate configuration gauge. No material was removed at these locations during the rework to the large size. Accordingly, Figure C16 and to a lesser extent Figure C15 show non-linear inelastic behaviour for load case 1 and considerably less overall hysteresis than Figures C13 and C14. The behaviour in Figures C15 and C16 is consistent with the prior yielding from the final +7.33 *g* load case 4 of the intermediate configuration. In fact gauge 73_2 of Figure C16 was at a location corresponding to the peak strain point of the intermediate configuration.

11.3 FFVH#14

Fuel flow vent hole number 14 (FFVH#14) can be seen in Figure 1 to be a similar and adjacent structural feature to FFVH#13. Gauges were fitted to the lower inboard and upper outboard corners of FFVH#14, as for FFVH#13. FFVH#14 was not reworked

and remained in a baseline configuration throughout the tests. The same strain gauges remained fitted to FFVH#14 throughout the tests.

The strain distribution and strain history plots from the gauges around FFVH#14 are shown in Figures C17 to C30. The peak strain at the lower inboard corner of FFVH#14 under +7.33 g load is seen in Table 2 to be comparable to that at the upper outboard corner of FFVH#13. The peak strain at the upper outboard corner of FFVH#14 under +7.33 g load is seen in Table 2 to be somewhat less and of the order of 9 500 με for all three rounds of testing.

The strain versus load behaviour around FFVH#14 is consistent with prior yielding due to prior service and testing. There is some hysteresis at the lower inboard corner but virtually none at the upper outboard corner. The configuration changes to FFVH#13 appear to have little effect on FFVH#14.

11.4 SRO#2 - Inside

The strain data from the inside edge of stiffener runout number 2 are shown in Figures C31 to C34 as strain distribution plots and in Figures C35 to C 37 as strain history plots. Figure C34 shows that the baseline configuration produced the highest peak strain and that the intermediate configuration produced the lowest peak strain, although the peak strain may not have been captured for that configuration.

At face value it may then be concluded that the intermediate configuration is optimal. However, the influence of prior residual stress/strain states needs to be considered in correlation with an FE analysis. The elastic FE analyses in [10, 12, 26] covered rework radii of 4 mm, 11 mm and 22 mm as well as a full grind out case, and found that the 22 mm radius gave the lowest stress. A second set of elastic/plastic FE analyses [25] covered rework radii of 4 mm, 11.4 mm, 19.8 mm and 25.4 mm as well as a full grind out case, and found that the full grind out case gave the lowest stress and that the 25.4 mm radius was best for limited reworks. However, the reworks in [10, 12, 25, 26] were configured differently from those of this report, in that they cut into the stiffener runout height, whereas the reworks here kept the runout height constant. It is therefore not possible to directly correlate the strain results of this report with the FE results in [10, 12, 25, 26].

A pervading difficulty in identifying an optimum rework radius for SRO#2 is the number of geometric parameters having an influence on the stress distribution. When considering rework of a runout by a circular arc cutter there are three basic parameters: i) radius of cut; ii) depth of cut into the runout; and iii) positioning of the cut spanwise along the runout. Other influential parameters have been identified in [25] as the thickness of the plate to which the stiffener is attached and the 'kink' angle in that plate. The interacting influences of these parameters has not been fully explored in previous FE analyses. If an optimised rework is to be pursued in future, the recommended course is to establish a good FE model by correlating with the data in

this report (and/or data from previous strain surveys) and then performing an optimisation analysis of the runout shape using the techniques developed in [29]. The optimal shape will most likely not be a circular arc but should nonetheless be practicable.

The reworking of SRO#2 from baseline to intermediate to large shape involved very little material removal (Figure 4) and so the yielding from each round of tests may have affected the succeeding round of tests. The first round of tests on the baseline configuration would have been affected by prior yielding due to prior service and testing. The shift in the maximum strain location between the baseline and intermediate tests may have meant that this location for the intermediate configuration tests was largely free of the influence of a prior residual state. The resolution of these possibilities requires an FE analysis of SRO#2 (incorporating the rework configurations implemented here) to define the plastic zones and produce a figure similar to Figure 9. At this stage it can only be concluded that the intermediate configuration appears to be the best of the three configurations tested but the test data need to be correlated with an FE analysis to allow a definitive conclusion.

The load history plots (Figures C35 to C37) of the peak strain from the three configurations show similar hysteresis behaviour, but the hysteresis in Figure C35 would appear greater and the discontinuities eliminated if the erroneous 70% load case and load case X were included in the plot.

11.5 SRO#2 - Outside

The strains on the outside of the wing pivot fitting upper plate directly opposite SRO#2 are of interest. The strain distributions are plotted in Figures C38 to C41 and strain histories from two gauges are plotted in Figures C42 to C47. Figure C41 shows that the strains outside SRO#2 are quite low, being all less than 2 000 με compared to far field plate strains of the order of 4 000 με. This is because the secondary bending caused by the change in section that constitutes SRO#2 has the effect of concentrating the stiffener strain inside SRO#2 but counteracting and reducing the plate strain outside SRO#2.

The point of interest from the strain data from outside SRO#2 is the non-linear, but elastic, strain versus load behaviour for the positive load section of the strain history plots in Figures C42 to C47. Figures C42 to C44 show the history of the peak strain outside SRO#2 and show a degree of non-linearity which appears to be bi-linearity with a transition region at low positive load. Such behaviour would be consistent with a transition to altered load paths when going from negative to positive loading. In [26] this same behaviour was noted from earlier strain surveys and was attributed to bolt slippage in the joint between the wing pivot fitting and the outer wing. Figures C45 to C47 from a gauge at a lower strain location show considerably more non-linearity at positive loads, but again, the behaviour tends to become linear at the higher positive loads.

11.6 Faces of Stiffener Number 3

Figures C48 to C53 show the strain histories from the three elements of two opposite rosette gauges on the forward and aft faces of stiffener #3 between FFVH#13 and FFVH#14 for the baseline configuration only. Note that element 1 of gauge 79 corresponds to element 2 of gauge 83 and vice versa and the discontinuities at zero load in the plots are due to the erroneous 70% load case and load case X which have not been plotted.

The notable features of the plots in Figures C48 to C53 are the bi-linear behaviour between positive and negative loading, the different strain fields between the front and back faces and the unusual hysteresis behaviour shown by one gauge element. These features are discussed below.

The bi-linear behaviour is evident in all the plots in Figures C48 to C53 except for Figure C48. In Figure C49 the bi-linearity is so marked that there is a negative strain response to both positive and negative loading. It is attributed to a change in load path between positive and negative loading associated with the action of the wing pivot lug which is adjacent to this area (Figure 1). For positive uploading of the wing, the upper plate lug reaction will be on the outboard side of the lug adjacent to FFVH#13 but, for negative downloading of the wing, the upper plate lug reaction will be on the inboard side of the lug remote from FFVH#13. This change in the lug reaction location changes the stress and strain distribution throughout the wing pivot fitting upper plate (and similarly the lower plate) and particularly affects the areas near the pivot.

The difference in strain states between the front and back faces of stiffener #3 was also noted in [15] and is attributed to the shear loads being fed into the stiffener by the titanium shear web which is attached to it. The attachment of the shear web is by a bolted lap joint to the back face of the stiffener (see the drawings in Appendix A for the structural arrangement of the shear web). The shear load being fed into the stiffener is then offset from its mid-plane and induces through-the-thickness stress and strain variation.

The unusual hysteresis behaviour under positive loads shown in Figure C49 is difficult to explain. It would seem to arise from a sudden shift in load paths, perhaps associated with clamping friction slippage in the web to stiffener bolted joint. The effect appears magnified in Figure C49 because the strains are so small. The strain band of the hysteresis is less than 100 $\mu\varepsilon$ and is negligible in comparison to the primary direction strains.

Figures C54 to C57 show the strain histories of back and front face gauge elements 78_1 and 82_2 on stiffener #3. These elements were oriented along the stiffener in the principal bending strain direction. They were located just below FFVH#13 and only the histories for the baseline and intermediate configurations are available because too much material was removed to fit these gauges to the large configuration. Aside from the previously discussed bi-linearity and front to back face differences, the notable

feature of these plots is the non-linear strain hardening behaviour and associated hysteresis at high positive load. The behaviour is most apparent in Figure C55 and is most pronounced in the first +7.33 *g* load case of the CPLT cycle. It is difficult to explain but may be due to stress redistribution resulting from yielding around FFVH#13.

11.7 Along Stiffener Number 3

The strain distribution on the outside of the upper plate of the wing pivot fitting opposite stiffener #3 is shown in Figure C58. The strains were generally constant except for a sharp rise at gauge 287 which is inboard of FFVH#13 and getting very close to the pivot lug boss. Typical strain histories for these gauges are shown in Figures C59 and C60 where their response is seen to be linear elastic.

Single gauges were fitted to the inside of the upper plate at the centre of FFVH#13 and FFVH#14. Their strain histories for the baseline configuration are shown in Figures C61 and C62. They are seen to be bi-linear elastic. The responses of these gauges were similar for the intermediate and large configurations as well.

Figure C63 shows the strain distribution along the inside edge of stiffener #3. The gauges along the stiffener edge were not fitted for the baseline configuration. The strains along the edge of the stiffener are reasonably low and constant except for the region of FFVH#13 which causes significant perturbations. Strain histories for two of these gauges for the intermediate configuration are shown in Figures C64 and C65. The strain versus load behaviour is seen to have a degree of non-linearity and hysteresis most likely due to the effects of the web attachment. Because the strains are reasonably low these effects are not significant to the overall behaviour of the wing pivot fitting or the behaviour around FFVH#13.

11.8 Shear Web

Figure C66 shows the strain distribution along the edge of the shear web near FFVH#13 and FFVH#14. The strains are reasonably constant and comparable to those along the adjacent edge of the stiffener (Figure C63). A sample strain history from these gauges is shown in Figure C67. It shows slightly more non-linearity and hysteresis than do the gauges along the stiffener edge (Figures C64 and C65) but the behaviour is somewhat similar.

Example strain histories from two opposite front and back face rosette gauges on the shear web are shown in Figures C68 to C73 from the large configuration round of tests. Note that element 1 of gauge 27 corresponds to element 3 of gauge 267 and vice versa. The plots in Figures C68 to C73 show similar behaviour of the corresponding front and back face gauge elements although the peak strain levels are different in some cases. That difference is attributed to the offset attachment of the web to the stiffeners. The

pervading bi-linearity in the wing pivot fitting is magnified in Figures C68 and C73 (as in Figure C49) because of the very low strain levels. The bi-linearity is not apparent in Figure C69 and is only a small effect in Figure C72. This may be because these gauge elements are oriented at 45° and respond primarily to the shear in the shear web which is not affected by the bi-linear lug action which primarily affects bending stresses.

11.9 Upper Plate

A number of rosette gauges were fitted to the inside surface of the upper plate of the wing pivot fitting. These gauges were fitted mid bay between stiffeners and indicated far-field strains mainly due to wing bending. Gauge 97 was fitted to the bay adjacent to FFVH#13 and the strain histories from its three elements for the baseline configuration are given in Figures C74 to C76. The strain behaviour is seen to be distinctly bi-linear elastic and is typical of the behaviour exhibited by all the mid-bay gauges and for the three configurations.

The plot in Figure C74 shows that the far-field bending strain inside the upper plate is of the order of 4 500 με. This can be considered as a nominal reference value to quantify strain concentration factors of structural features such as FFVH#13 and SRO#2 in order to characterise their severity. To that end, referring to Table 2, the strain concentration factor of FFVH#13 ranges from 3.9 to 4.8 and that of SRO#2 ranges from 2.6 to 3.4 across the three configurations.

12. Conclusion

The aims of the tests were met in that the strains around FFVH#13 and SRO#2 and in their vicinities were successfully measured for three configurations of those structural features. Strain histories at many locations were measured over a CPLT cycle for each configuration.

The strain behaviour in the wing pivot fitting proved to be complex and required an understanding of the structural and material behaviour for meaningful interpretation. FFVH#13 and SRO#2 are effectively notches which produce a significant strain concentration, up to 4.8 for FFVH#13 and 3.4 for SRO#2. Under the maximum + 7.33 g load of the CPLT cycle the strain levels at both of them are well in excess of the yield strain and a large zone of yielding is generated around them. Therefore, a zone of deformed material in a residual stress/strain state remains after CPLT loading. The influence of this residual material state on subsequent loading on a different configuration needs to be considered in order to properly interpret the subsequent strain versus load behaviour. The situation is further complicated by the removal of material when reworking to a new configuration. It has been concluded that the baseline configuration tests of this report have been influenced to an unknown extent by yielding from prior service and testing of the wing. However, the yield zones at the

critical lower inboard corner of FFVH#13 were virtually fully removed by the reworks to larger configurations and so the subsequent behaviour at that location for both the intermediate and large configurations would have been representative of virgin material. The situation at SRO#2 is less clear because less material was removed and an FE analysis of the test configuration was not available to determine the plastic zone size.

Load case 2 of the CPLT cycle involved application of loads up to a +7.33 g loading condition at 56° wing sweep and load case 4 involved application of loads up to +7.33 g at 26° wing sweep. The strain versus load behaviour of these two load cases was effectively identical for all locations at and around FFVH#13, FFVH#14 and SRO#2. This indicates that wing sweep angle has no significant effect on these locations and the cyclic plasticity behaviour saturates after the first loop.

A significant feature of the structural behaviour of the wing pivot fitting is the bi-linear strain versus load characteristic at virtually all locations due to the lug action of the wing pivot. In some situations the bi-linearity is so marked that strains of the same sign are produced by both up and down loading.

Another feature of the structural behaviour of the wing pivot fitting is the influence of the titanium shear web attachment to the stiffeners. The simple bolted lap joint arrangement causes through-the-thickness variation of the strains in the web and the stiffeners and considerable non-linearity and hysteresis in the strain versus load behaviour. These effects are attributed to the offset nature of the lap joint and possibly to slippage in the bolted joint arrangement.

The test results have shown that the rework of FFVH#13 gives a good reduction in peak strain at the lower inboard corner. The effect of the reworks on the upper outboard corner is less clear. There is an apparent increase in peak strain but the baseline strains were influenced by a residual state from prior service and tests.

The strains at the lower inboard corner of FFVH#14 were of the same order as the strains at the upper outboard corner of FFVH#13 and were not significantly affected by the reworks to FFVH#13. The strains at the upper outboard corner of FFVH#14 were somewhat lower and only 25% above yield strain.

The strain results from SRO#2 indicate that the intermediate rework radius of 15.2 mm is the optimum of the three radii tested. However, because of the complicating influence of initial stress/strain states due to prior yielding, the strain data should be correlated with an FE analysis before a definitive conclusion can be made on an optimum rework radius for the stiffener runout. It is recommended that a better approach would be to perform an optimisation FE analysis of the SRO#2 profile using the methodology of [29] and to verify it with carefully controlled tests.

13. Acknowledgments

The contributions of Mr Kevin Desmond to the conduct of the tests and the preparation of tables for this report are recognised and appreciated by the author, as are the contributions of Mr Brendon Murtagh to the preparation of plots and Mr Tom van Blaricum, Ms Kate Lillingston, Mr Geoff Swanton, Mr Ben Park and Mr George Camov to various aspects of the test conduct.

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Appendix A:

Strain Gauge Configuration for FFVH#13 and SRO#2

All the gauges fitted to the test wing in the vicinity of FFVH#13 and SRO#2 are listed in Table A1. The gauge configuration was changed between each round of testing such that not all the gauges listed in Table A1 were active for each round and some gauges which were active in each round had slightly different locations between rounds. These configuration changes are detailed in Table A1. The locations of all the gauges in Table A1 are shown in the attached drawings (Attachments 1 to 9).

Table A1: Strain Gauges Around FFVH#13 and SRO#2

Gauge ID	Gauge Type	Gauge Location	Usage			Drawing Reference
			Base	Inter.	Large	
72	Strip	Lower inboard corner FFVH#13	yes[1]	yes[1]	yes[1]	Att. 3, 6 & 7
259	Strip	Lower inboard corner FFVH#13	no[2]	yes[1]	yes[1]	Att. 3, 6 & 7
258	Strip	Lower inboard corner FFVH#13	no[2]	yes[1]	yes[1]	Att. 3, 6 & 7
300	Strip	Lower inboard corner FFVH#13	no[2]	no[2]	yes	Att. 3 & 7
301	Strip	Lower inboard corner FFVH#13	no[2]	no[2]	yes	Att. 3 & 7
302	Strip	Lower inboard corner FFVH#13	no[2]	no[2]	yes	Att. 3 & 7
303	Strip	Upper outboard corner FFVH#13	no[2]	no[2]	yes	Att. 3 & 7
73	Strip	Upper outboard corner FFVH#13	yes[1]	yes[1]	yes[1]	Att. 3, 6 & 7
260	Strip	Upper outboard corner FFVH#13	no[2]	yes[1]	yes[1]	Att. 3, 6 & 7
75	Strip	Lower inboard corner FFVH#14	yes	yes	yes	Att. 3
76	Strip	Upper outboard corner FFVH#14	yes	yes	yes	Att. 3
77	Rosette	Stiffener #3 aft face	yes	yes	yes	Att. 3
78	Rosette	Stiffener #3 aft face	yes	yes[1]	no[3]	Att. 3 & 6
79	Rosette	Stiffener #3 aft face	yes	yes	yes	Att. 3
80	Rosette	Stiffener #3 aft face	yes	yes	yes	Att. 3
81	Rosette	Stiffener #3 forward face	yes	yes	yes	Att. 3
82	Rosette	Stiffener #3 forward face	yes	yes[1]	no[3]	Att. 3 & 6
83	Rosette	Stiffener #3 forward face	yes	yes	yes	Att. 3
84	Rosette	Stiffener #3 forward face	yes	yes	yes	Att. 3
287	Single	Outside upper plate over stiff. #3	no[2]	yes	yes	Att. 3
38	Single	Outside upper plate over stiff. #3	yes	yes	yes	Att. 3
288	Single	Outside upper plate over stiff. #3	no[2]	yes	yes	Att. 3
39	Single	Outside upper plate over stiff. #3	yes	yes	yes	Att. 3
289	Single	Outside upper plate over stiff. #3	no[2]	yes	yes	Att. 3

Table A1 (continued): Strain Gauges Around FFVH#13 and SRO#2

Gauge ID	Gauge Type	Gauge Location	Usage			Drawing Reference
			Base	Inter.	Large	
40	Single	Outside upper plate over stiff. #3	yes	yes	yes	Att. 3
290	Single	Outside upper plate over stiff. #3	no[2]	yes	yes	Att. 3
71	Single	Inside upper plate at FFVH#13	yes	yes	yes	Att. 3
74	Single	Inside upper plate at FFVH#14	yes	yes	yes	Att. 3
261	Single	Edge of stiffener #3	no[2]	yes	yes	Att. 2 & 3
262	Single	Edge of stiffener #3	no[2]	yes	yes	Att. 2 & 3
263	Single	Edge of stiffener #3	no[2]	yes	yes	Att. 2 & 3
272	Single	Edge of stiffener #3	no[2]	yes	yes	Att. 2 & 3
273	Single	Edge of stiffener #3	no[2]	yes	yes	Att. 2 & 3
274	Single	Edge of stiffener #3	no[2]	yes	yes	Att. 2 & 3
275	Single	Edge of stiffener #3	no[2]	yes	yes	Att. 2 & 3
279	Single	Edge of web at stiffener #3	no[2]	yes	yes	Att. 2 & 3
280	Single	Edge of web at stiffener #3	no[2]	yes	yes	Att. 2 & 3
281	Single	Edge of web at stiffener #3	no[2]	yes	yes	Att. 2 & 3
282	Single	Edge of web at stiffener #3	no[2]	yes	yes	Att. 2 & 3
59/60	Strip	Inside SRO#2	yes[1]	yes[1]	yes[1]	Att. 4, 8 & 9
359/ 360	Strip	Inside SRO#2	no[2]	no[2]	yes	Att. 9
85	Single	Inside upper plate beside SRO#2	yes	yes	yes	Att. 4 & 8
86	Single	Inside upper plate beside SRO#2	yes	yes	yes	Att. 4 & 8
87	Single	Inside upper plate beside SRO#2	yes	yes	yes	Att. 4 & 8
88	Single	Inside upper plate beside SRO#2	yes	yes	yes	Att. 4 & 8
35	Single	Outside upper plate over stiff. #2	yes	yes	yes	Att. 3
58	Single	Edge of stiffener #2	yes	yes	yes	Att. 3
36/37	Strip	Outside upper plate over SRO#2	yes	yes	yes	Att. 3 & 4
90	Rosette	Inside upper plate mid bay	yes	yes	yes	Att. 4
91	Rosette	Inside upper plate mid bay	yes	yes	yes	Att. 4
92	Rosette	Inside upper plate mid bay	yes	yes	yes	Att. 4
95	Rosette	Inside upper plate mid bay	yes	yes	yes	Att. 4
96	Rosette	Inside upper plate mid bay	yes	yes	yes	Att. 4
97	Rosette	Inside upper plate mid bay	yes	yes	yes	Att. 4
25	Rosette	Shear web aft face	yes	yes	yes	Att. 2

Table A1 (continued): Strain Gauges Around FFVH#13 and SRO#2

Gauge ID	Gauge Type	Gauge Location	Usage			Drawing Reference
			Base	Inter.	Large	
26	Rosette	Shear web aft face	yes	yes	yes	Att. 2
278	Rosette	Shear web aft face	no[2]	yes	yes	Att. 2
27	Rosette	Shear web aft face	yes	yes	yes	Att. 2
264	Rosette	Shear web forward face	no[2]	yes	yes	Att. 2
265	Rosette	Shear web forward face	no[2]	yes	yes	Att. 2
266	Rosette	Shear web forward face	no[2]	yes	yes	Att. 2
267	Rosette	Shear web forward face	no[2]	yes	yes	Att. 2
268	Single	Edge lower plate stiff at shear web	no[2]	yes	yes	Att. 2 & 5
269	Single	Edge lower plate stiff at shear web	no[2]	yes	yes	Att. 2 & 5
270	Single	Edge lower plate stiff at shear web	no[2]	yes	yes	Att. 2 & 5
271	Single	Edge lower plate stiff at shear web	no[2]	yes	yes	Att. 2 & 5

Notes: 1. The precise position of these gauges changed for each round of tests because the gauges were removed and refitted as part of the rework process.

2. These gauges were not fitted until after the first or second rounds of tests.

3. These gauges were not fitted for the last round of tests because there was insufficient material left at that location after the large rework.

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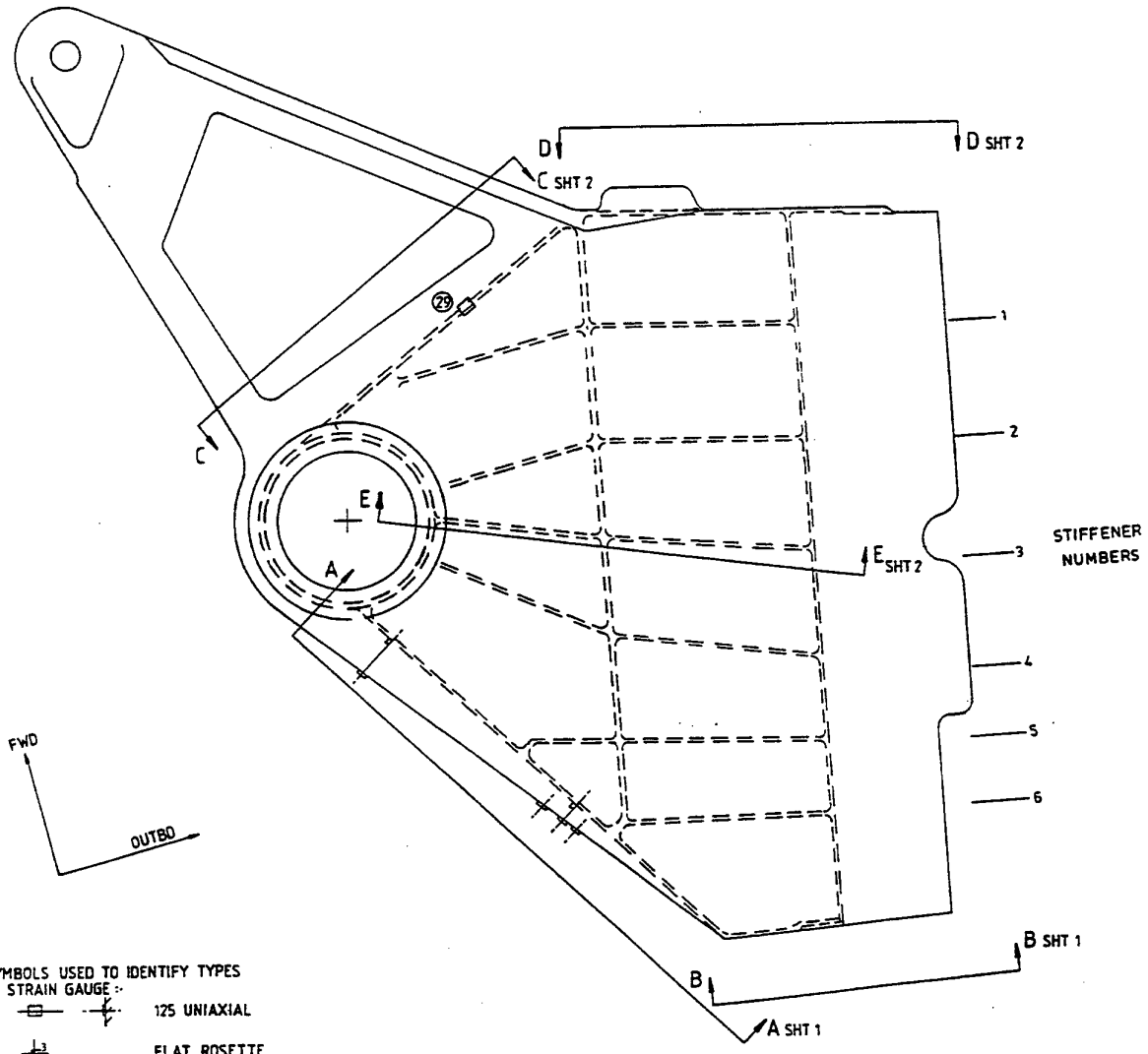
ATTACHMENT 1 to APPENDIX A



SYMBOLS USED TO IDENTIFY TYPES OF STRAIN GAUGE :-

1. 125 UNIAXIAL
2. FLAT ROSETTE
3. STRIP GAUGE (5 FOILS)
4. STACKED ROSETTE
5. 62 UNIAXIAL

VIEW LOOKING DOWN AT UPPER SURFACE OF WING PIVOT FITTING. R.H.S.

DATE	25-11-94	SCALE: : N.T.S.	DIMENSIONS ARE IN MM	3rd. ANGLE PROJECTION	DRG. PRACTICE - A.S. 1100/110
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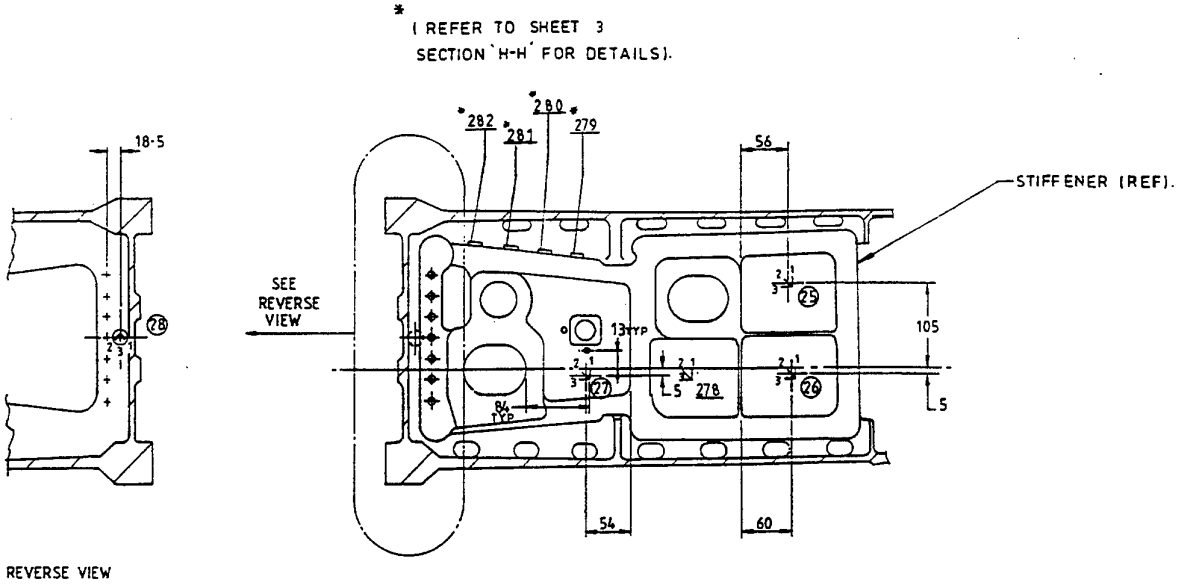
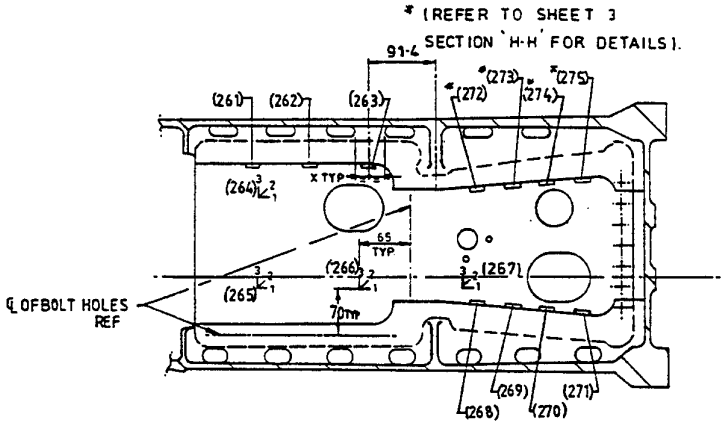
ATTACHMENT 2 to APPENDIX A



VIEW ON 'AFT' FACE OF STRUCTURE.

SECTION 'H-H' SHT 3.



VIEW ON FWD FACE OF STRUCTURE

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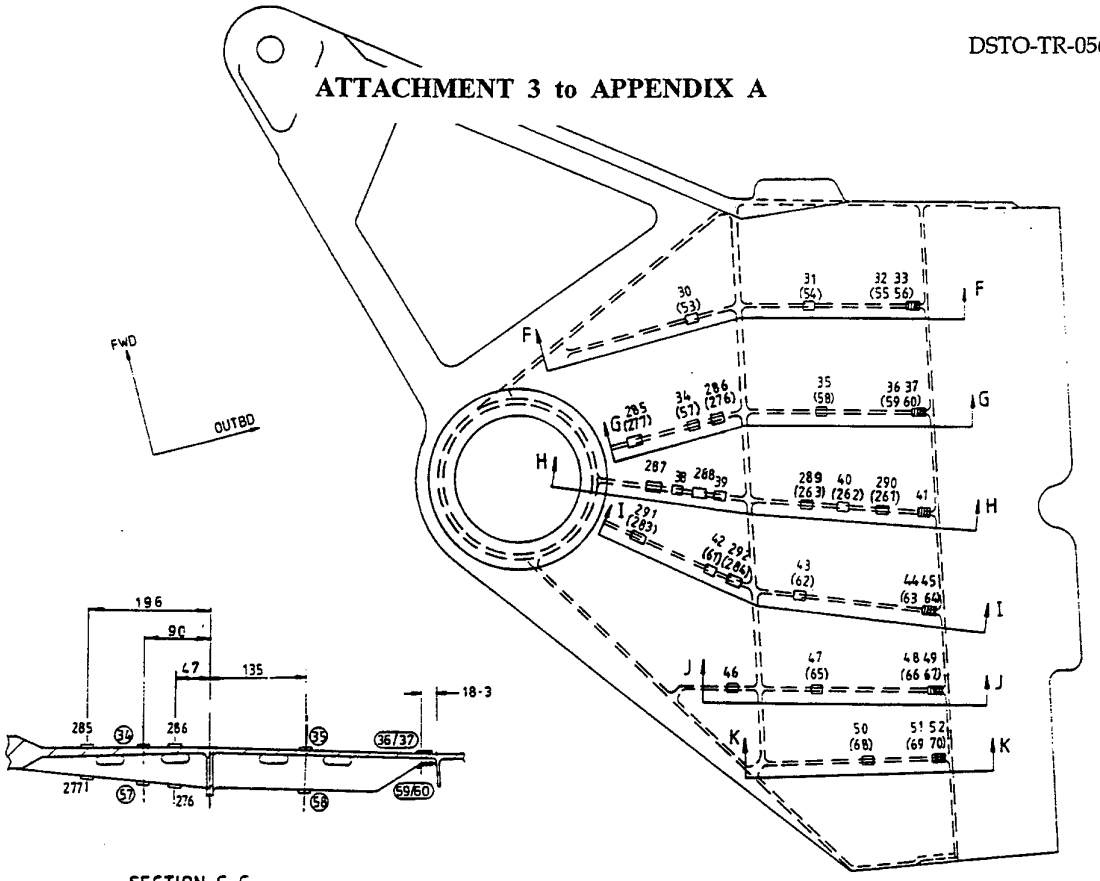
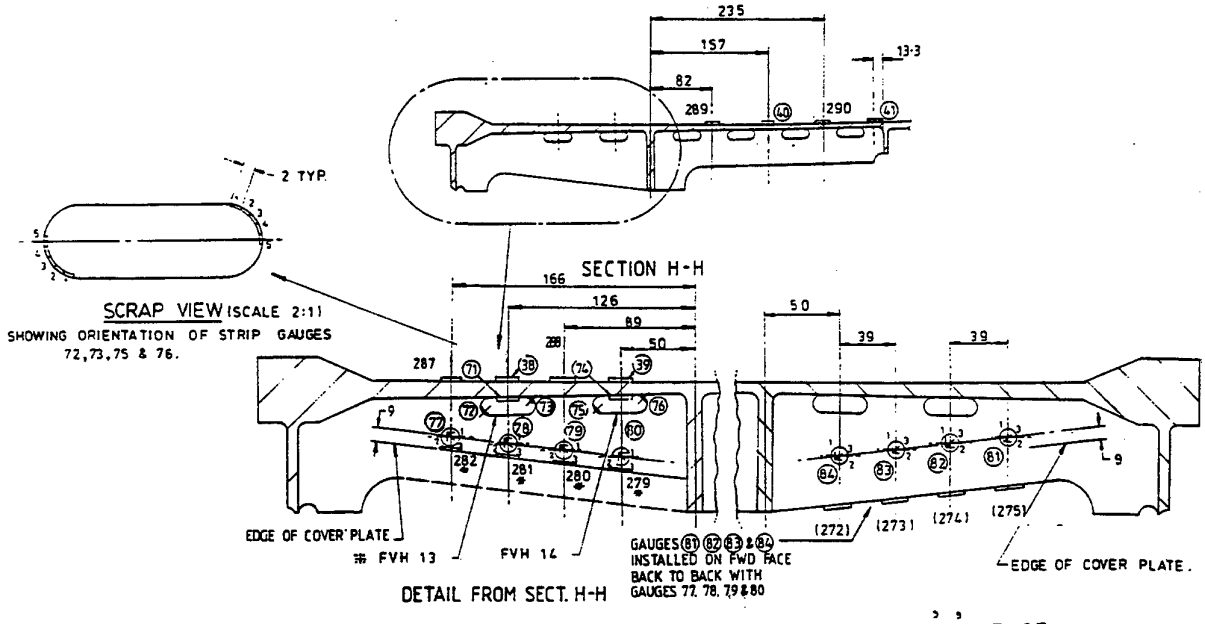
ATTACHMENT 3 to APPENDIX A



SECTION G-G

VIEW LOOKING DOWN AT UPPER SURFACE OF WING PIVOT FITTING R.H.S.



SCRAP VIEW (SCALE 2:1) SHOWING ORIENTATION OF STRIP GAUGES 72, 73, 75 & 76.

DETAIL FROM SECT. H-H

VIEW ON AFT FACE.

VIEW ON FWD FACE.

* GAUGES 279, 280, 281 & 282 ARE ATTACHED TO THE EDGE OF THE SHEAR WEB AND IN LINE WITH GAUGES 272, 273, 274 & 275 RESPECTIVELY.

NOTE: REFER TO DRG SE 5/52/14/RS 168 FOR LOCATION OF GAUGES 78 & 82 (AFTER FIRST REWORK)

NOTE: STRAIN GAUGE N°S THAT ARE BRACKETTED, REPRESENT ONE'S THAT ARE FITTED TO THE UNDERSIDE OF THE UPPER SURFACE

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* (FOR FIRST REWORK REFER TO DRG. SE 5/52/14/RS 168)
(FOR SECOND REWORK REFER TO DRG. SE 5/52/14/RS 177)

STRAIN GAUGE LOCATIONS - F111 WING PIVOT FITTING

DRG. NO SE5/52/14/RS100

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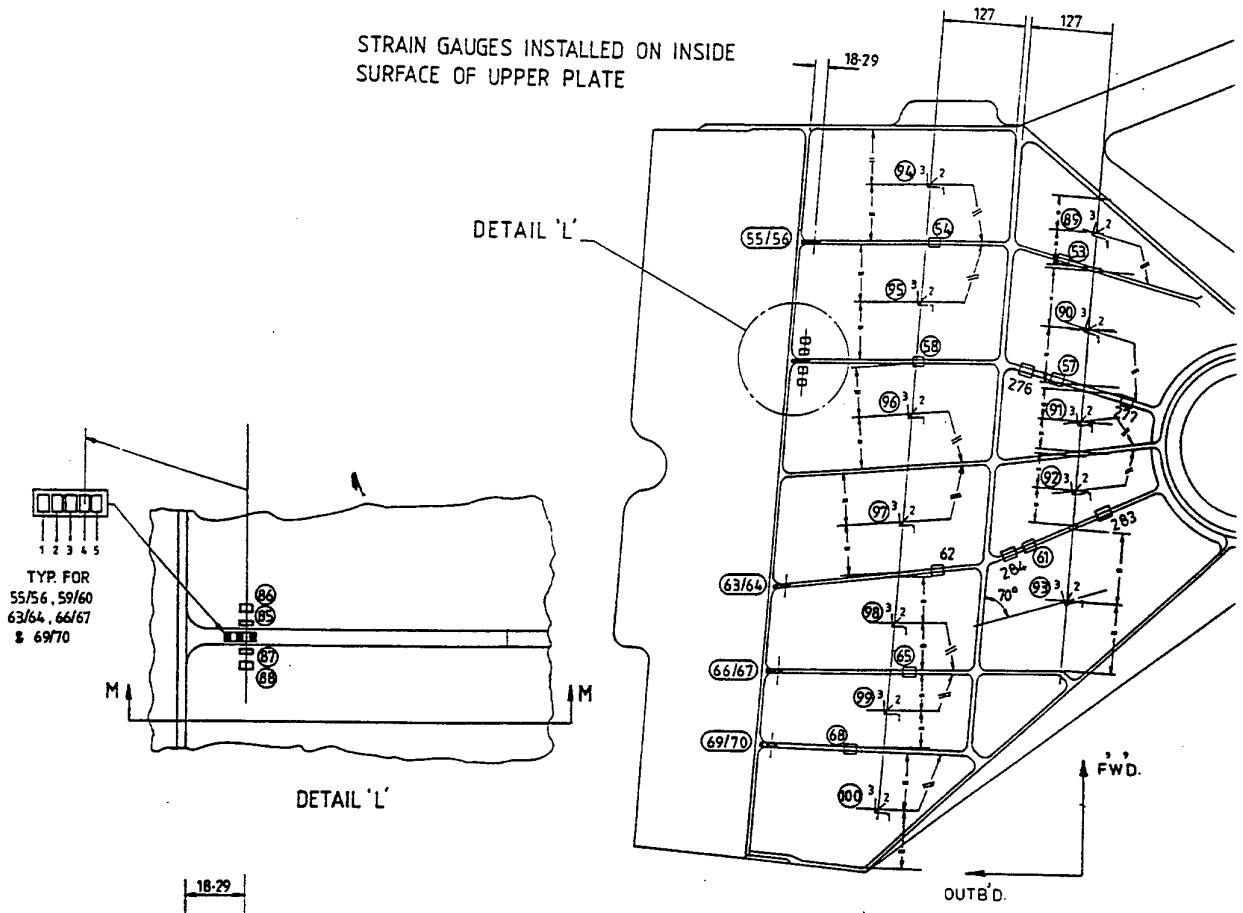
ATTACHMENT 4 to APPENDIX A



STIFFENER RUNOUT N° 2 AS SHOWN ON LOCKHEED DRAWING BEFORE REWORK.

(FOR FIRST REWORK REFER TO DRG. SE 5/52/14/RS 169)

(FOR SECOND REWORK REFER TO DRG. SE 5/52/14/RS 179).

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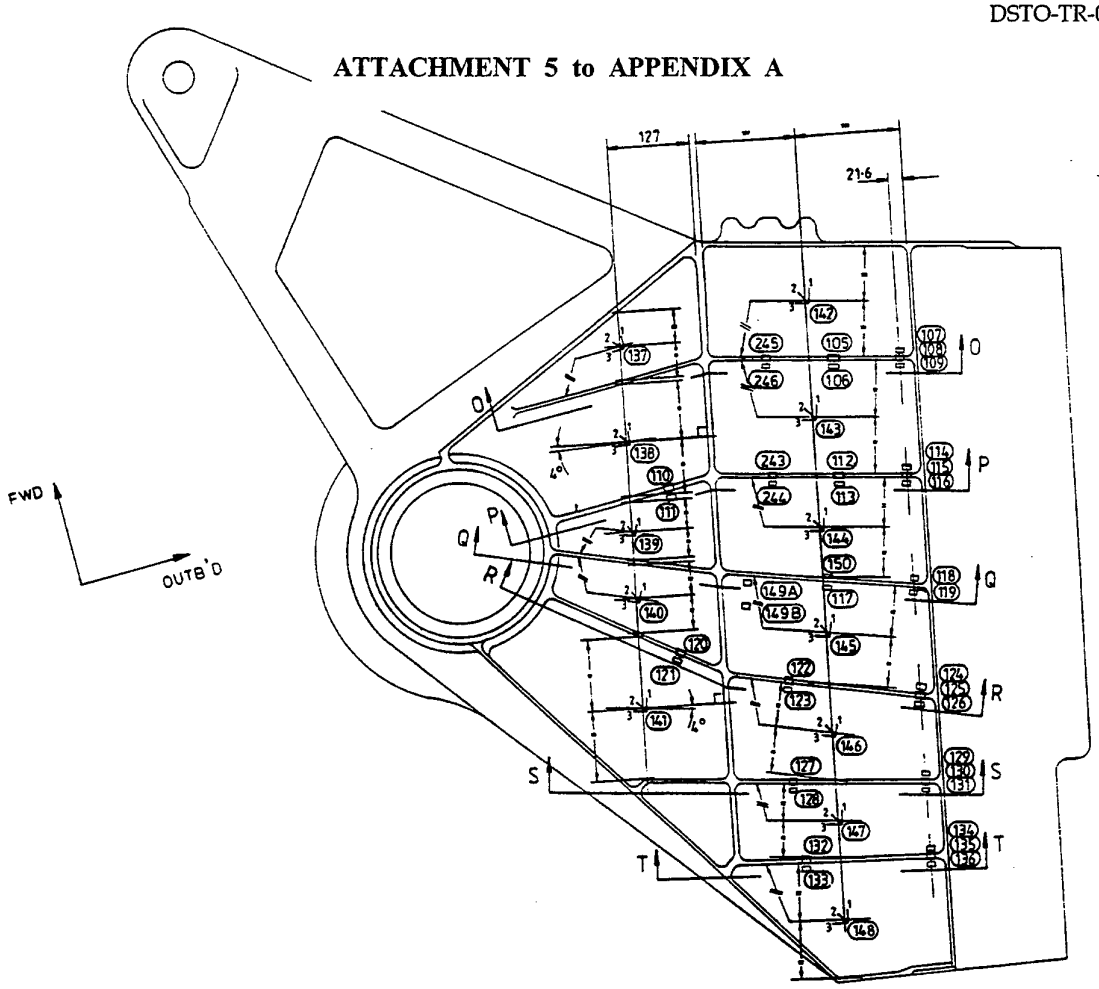
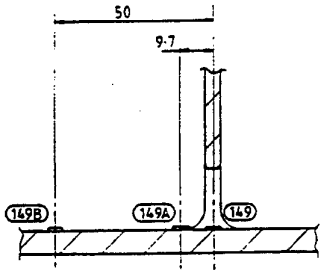
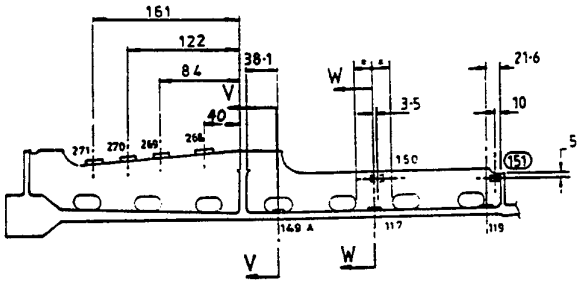
ATTACHMENT 5 to APPENDIX A



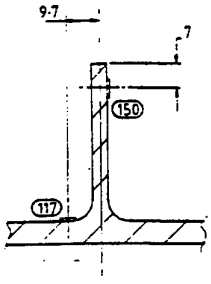
STRAIN GAUGES INSTALLED ON INSIDE SURFACE OF LOWER PLATE



SECTION V-V



SECTION Q-Q



SECTION W-W

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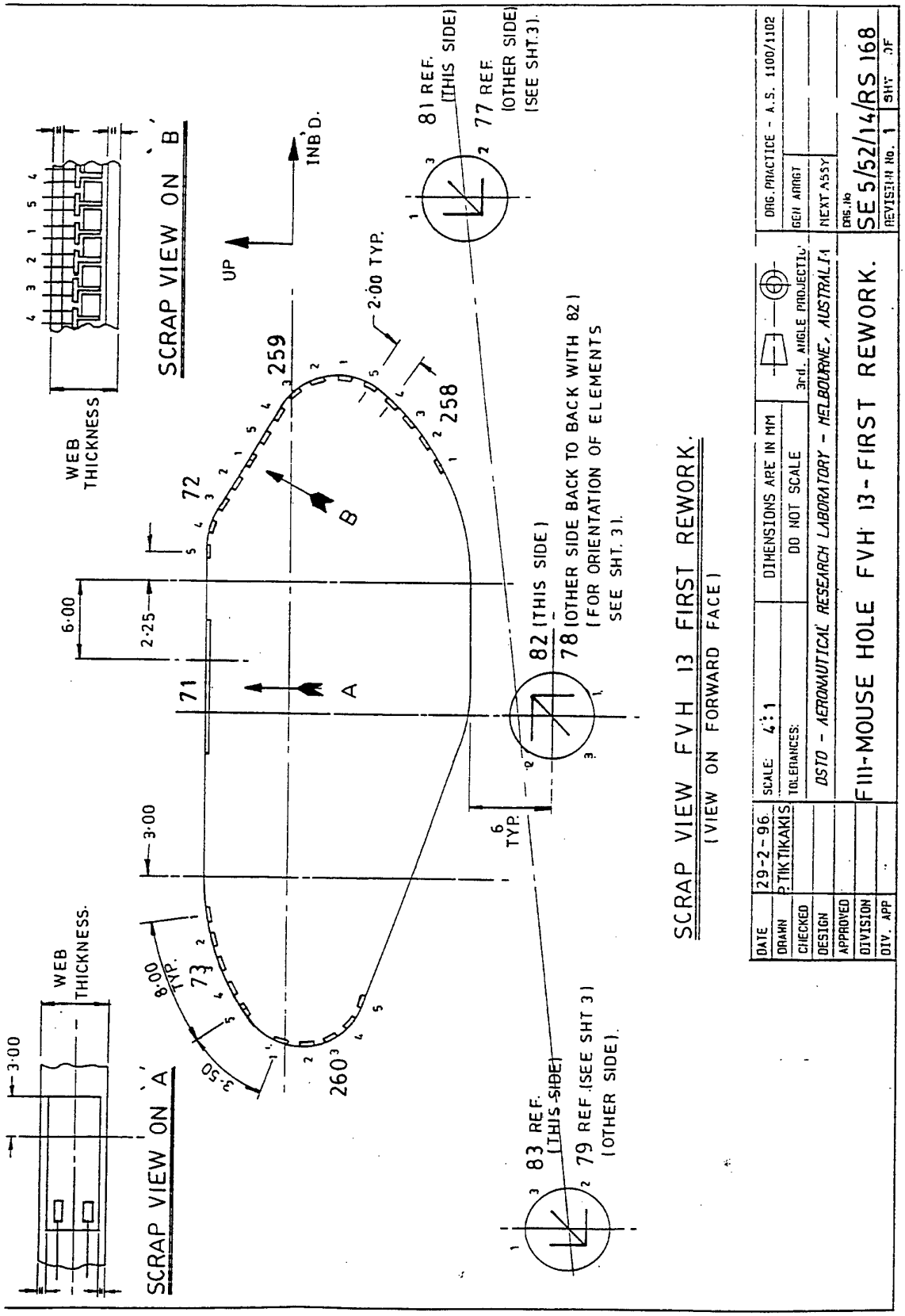
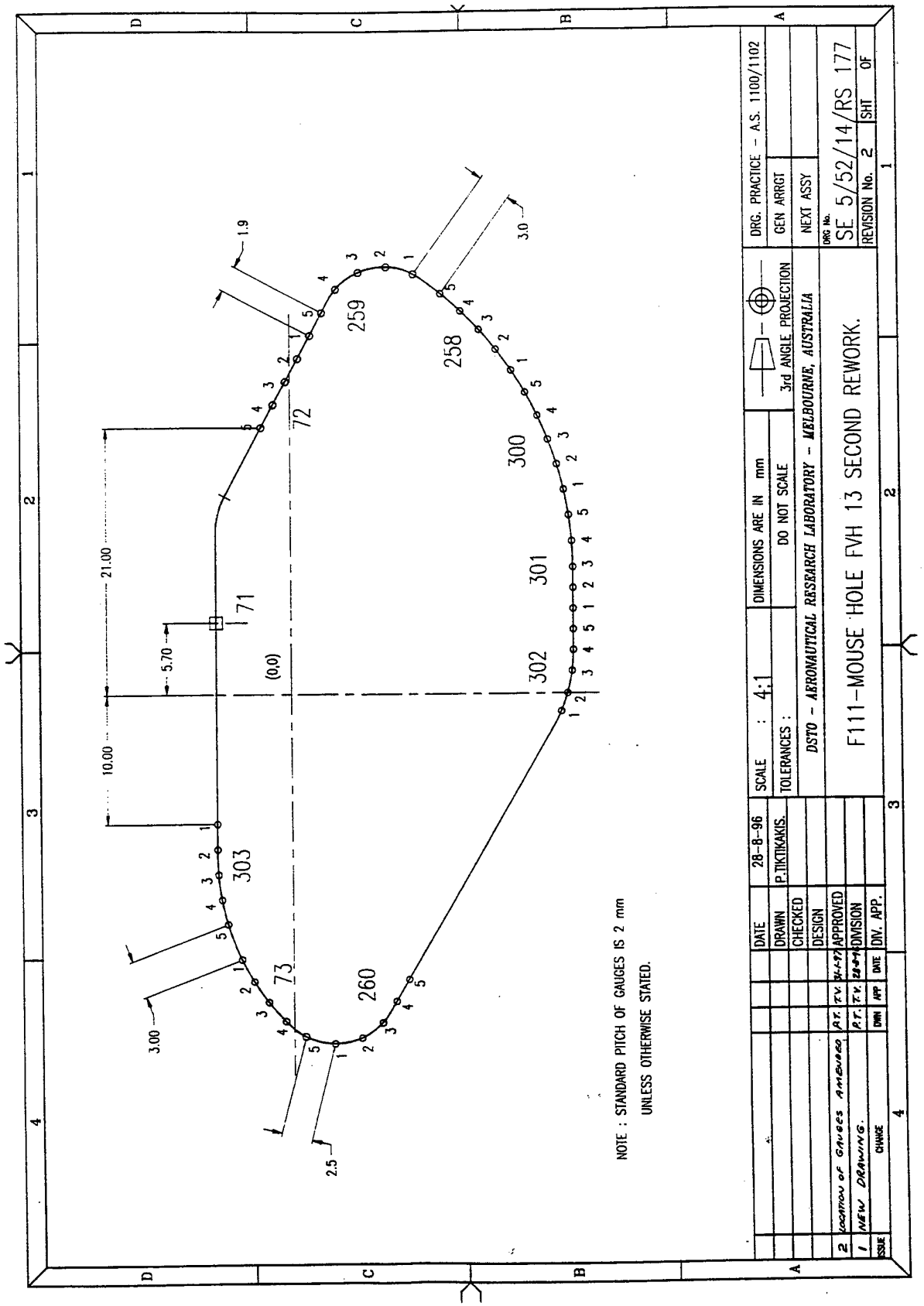
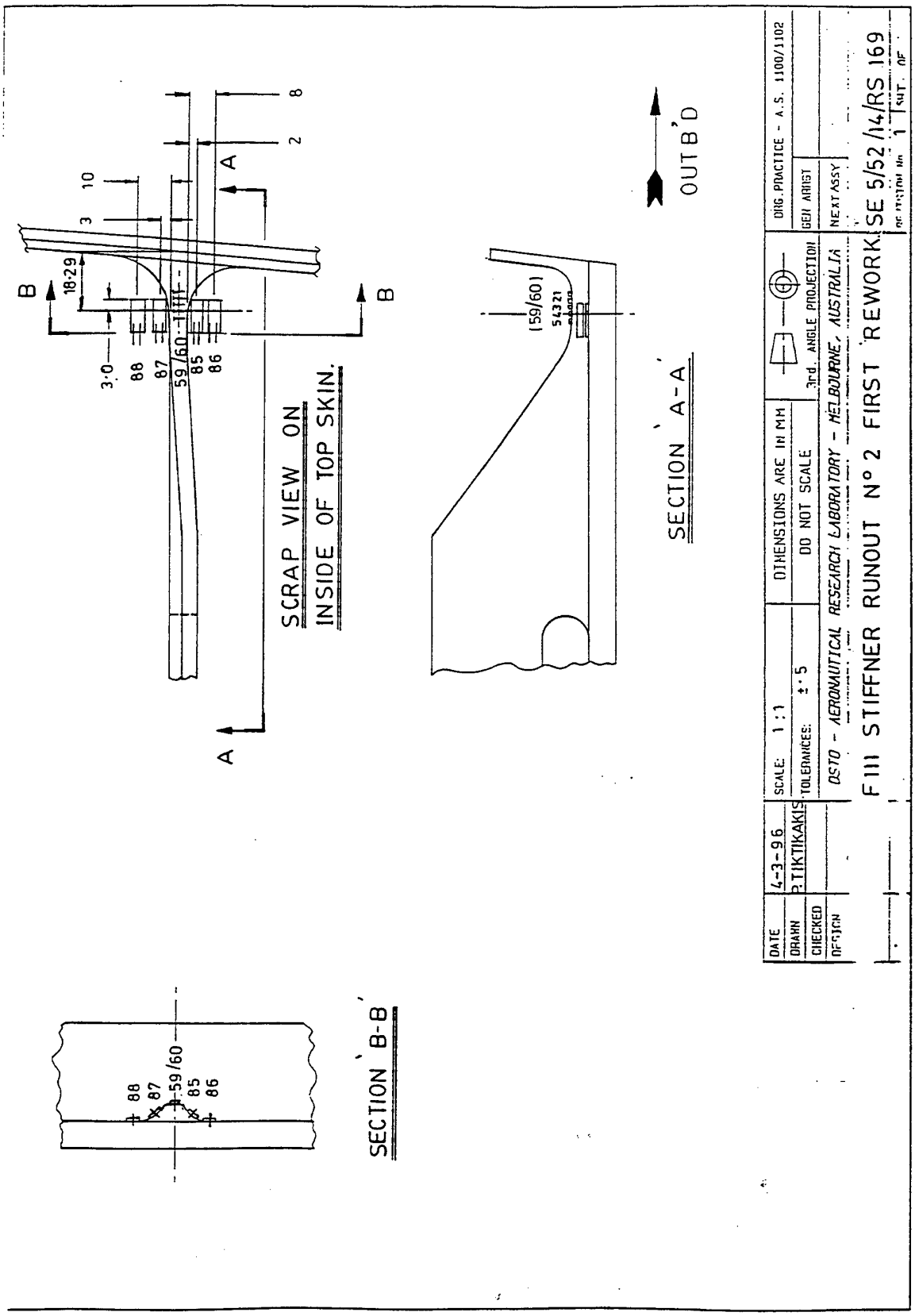
ATTACHMENT 6 to APPENDIX A



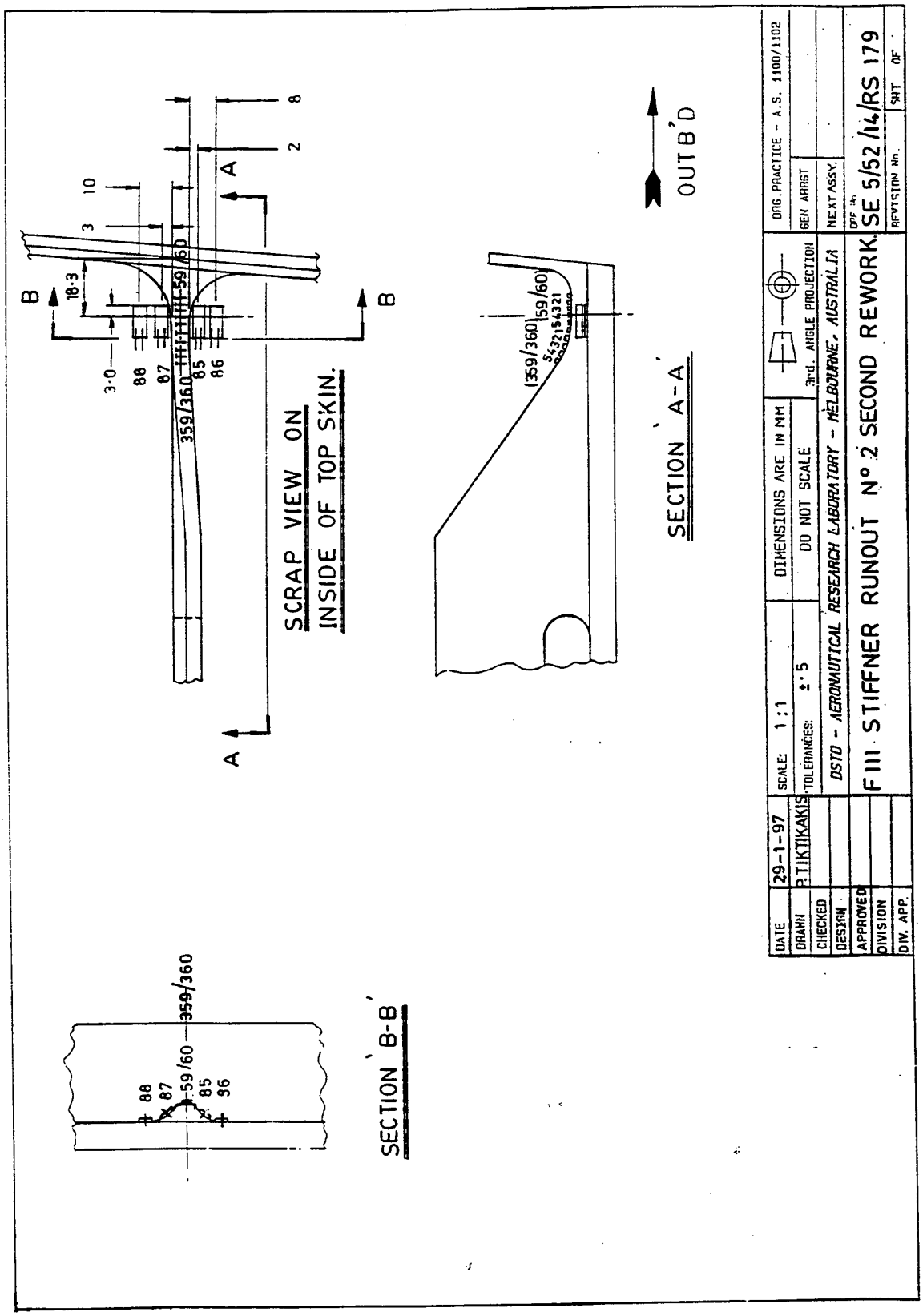
ATTACHMENT 7 to APPENDIX A



ATTACHMENT 8 to APPENDIX A



ATTACHMENT 9 to APPENDIX A



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Appendix B:

Tabulated Strain Data from the Tests

Tables of readings of the strain gauges and load cells are presented. Strains are presented in microstrain units and loads are presented in kiloNewton units.

For critical gauges around FFVH#13 and SRO#2, the complete data set at all load increments is presented in Tables B1 to B3 for the baseline, intermediate and large configuration tests respectively.

For all other gauges, only the zero and peak increment data values are presented in Table B4 to B6 (for the baseline, intermediate and large configuration tests respectively), and the difference between the initial zero value and the peak increment value is shown as a 'delta' value.

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Table B1: F111 Wing Test - Baseline Configuration
Complete CPLT Load and Strain Histories at FFVH#13, FFVH#14 and SRO#2

Load Case	Nominal %Load Level	Actuator ID						Gauge ID	
		Act. E	Act. F	Act. G	Act. H	Act. I	Act. J	72-1	72-2
		Load (kN)						Strain (microstrain)	
	0	0.0	0.0	0.0	-0.1	0.0	0.0	482	727
	10	-13.8	0.0	0.0	-10.5	0.0	0.0	837	1126
	20	-27.7	0.0	0.0	-20.8	0.0	0.0	1192	1527
	30	-41.3	0.0	0.0	-31.2	0.0	0.0	1552	1929
	40	-55.1	0.0	0.0	-41.6	0.0	0.0	1906	2331
	50	-69.0	0.0	0.0	-52.0	0.0	0.0	2258	2732
-2.4g	60	-82.7	0.0	0.0	-62.5	0.0	0.0	2621	3147
	70	-96.5	0.0	0.0	-72.9	0.0	0.0	2991	3570
56deg.	80	-110.3	0.0	0.0	-83.3	0.0	0.0	3378	4039
Wing	90	-124.1	0.0	0.0	-93.6	0.0	0.0	3841	4671
Sweep	100	-134.6	0.0	0.0	-104.1	0.0	0.0	4314	5345
	80	-110.2	0.0	0.0	-83.3	0.0	0.0	3583	4525
	50	-69.0	0.0	0.0	-52.1	0.0	0.0	2486	3293
	20	-27.7	0.0	0.0	-20.9	0.0	0.0	1424	2102
	10	-13.9	0.0	0.0	-10.5	0.0	0.0	1073	1708
	20	-27.6	0.0	0.0	-20.8	0.0	0.0	1435	2116
	0	-0.1	0.0	0.0	-0.2	0.0	0.0	734	1327
	0	0.1	-0.1	0.0	-0.3	0.0	0.1	799	1352
	10	10.3	13.2	13.0	13.2	2.0	3.3	-495	-100
	20	20.7	26.3	25.6	26.5	4.0	6.5	-1822	-1611
	30	30.9	39.5	38.0	39.6	6.1	9.6	-3163	-3158
	40	41.2	52.7	50.5	52.8	8.1	12.8	-4538	-4782
	50	51.6	65.8	62.9	65.9	10.1	16.0	-5925	-6458
	60	61.9	79.0	75.3	79.1	12.2	19.2	-7320	-8206
	70	72.2	92.2	87.8	92.2	14.2	22.3	-8728	-10041
	dr. level	-0.2	-1.1	-1.0	-1.6	7.7	-0.2	508	600
	re-zero	0.5	0.4	0.2	0.0	0.0	1.1	614	717
	0	0.1	-0.1	-0.1	-0.3	0.0	0.1	645	757
	10	10.4	13.1	12.9	13.2	2.0	3.3	-657	-710
+7.33g	20	20.7	26.3	25.5	26.4	4.1	6.5	-2003	-2251
	30	30.9	39.4	37.9	39.6	6.1	9.6	-3336	-3786
56deg.	40	41.2	52.6	50.5	52.8	8.1	12.8	-4681	-5340
Wing	50	51.5	65.8	63.0	65.9	10.1	16.0	-6053	-6928
Sweep	60	61.9	79.0	75.4	79.1	12.2	19.2	-7418	-8530
	70	72.2	92.2	87.8	92.2	14.2	22.3	-8794	-10185
	80	82.5	105.4	100.2	105.3	16.2	25.5	-10176	-11933
	90	92.7	118.6	112.7	118.4	18.3	28.7	-11609	-13921
	100	103.0	131.5	125.1	131.5	20.3	31.9	-13180	-16353
	80	82.5	105.3	100.4	105.2	16.2	25.5	-10590	-13425
	50	51.6	65.8	62.9	65.8	10.1	16.0	-6532	-8732
	20	20.7	26.4	25.4	26.3	4.1	6.5	-2357	-3618
	10	10.3	13.1	12.5	12.6	2.0	3.3	-873	-1683
	20	20.7	26.4	25.3	26.4	4.0	6.5	-2233	-3229
	0	0.0	0.0	0.0	-0.3	0.0	0.2	559	215

Table B1: F111 Wing Test - Baseline Configuration
Complete CPLT Load and Strain Histories at FFVH#13, FFVH#14 and SRO#2

Load Case	Nominal %Load Level	Gauge ID							
		72-3	72-4	72-5	73-1	73-2	73-3	73-4	73-5
		Strain (microstrain)							
	0	953	229	-34	172	259	128	41	377
	10	1403	614	176	506	614	460	263	399
	20	1854	994	376	839	966	786	474	416
	30	2301	1366	570	1169	1315	1109	685	436
	40	2755	1745	770	1501	1668	1437	900	463
	50	3208	2120	966	1835	2021	1763	1112	487
-2.4g	60	3679	2504	1161	2174	2381	2095	1326	510
	70	4159	2888	1355	2520	2747	2429	1538	529
56deg.	80	4688	3274	1531	2869	3124	2770	1752	559
Wing	90	5345	3653	1666	3254	3556	3130	1954	579
Sweep	100	5998	3979	1761	3628	3973	3460	2125	583
	80	5067	3180	1331	2939	3240	2771	1667	536
	50	3693	2037	740	1927	2171	1785	1031	485
	20	2369	940	174	938	1135	838	424	438
	10	1934	582	-9	616	796	527	223	419
	20	2393	971	199	953	1156	864	446	442
	0	1509	229	-194	300	464	223	28	403
	0	1499	278	-166	330	488	253	49	377
	10	-130	-1115	-922	-811	-689	-805	-625	307
	20	-1865	-2626	-1794	-1968	-1889	-1904	-1364	160
	30	-3663	-4192	-2714	-3141	-3116	-3038	-2139	-19
	40	-5581	-5754	-3593	-4332	-4372	-4190	-2921	-198
	50	-7580	-7299	-4433	-5533	-5643	-5345	-3695	-370
	60	-9684	-8839	-5234	-6730	-6922	-6499	-4466	-549
	70	-11917	-10394	-5939	-7920	-8201	-7642	-5222	-737
	dr. level	539	239	262	149	241	142	66	463
	re-zero	658	311	277	248	337	213	94	441
	0	708	347	295	278	369	241	111	442
	10	-946	-1047	-454	-867	-809	-818	-561	374
+7.33g	20	-2724	-2593	-1343	-2041	-2029	-1935	-1309	226
	30	-4511	-4155	-2253	-3202	-3246	-3061	-2081	38
56deg.	40	-6318	-5727	-3165	-4376	-4478	-4200	-2859	-146
Wing	50	-8167	-7306	-4067	-5568	-5729	-5354	-3642	-327
Sweep	60	-10060	-8878	-4951	-6759	-6982	-6508	-4427	-509
	70	-12064	-10477	-5815	-7961	-8251	-7672	-5218	-698
	80	-14264	-12151	-6548	-9153	-9529	-8834	-5997	-891
	90	-17132	-14409	-6941	-10404	-10898	-10065	-6738	-1086
	100	-21549	-17316	-7047	-11766	-12385	-11649	-7477	-1249
	80	-18201	-14364	-5322	-9483	-10002	-9444	-5974	-934
	50	-12676	-9536	-2573	-5935	-6271	-5973	-3598	-337
	20	-6289	-4412	-113	-2315	-2427	-2445	-1258	291
	10	-3785	-2583	587	-1061	-1080	-1228	-490	533
	20	-5570	-4135	-288	-2253	-2319	-2364	-1238	412
	0	-1373	-930	1125	147	200	-112	164	741

Table B1: F111 Wing Test - Baseline Configuration
Complete CPLT Load and Strain Histories at FFVH#13, FFVH#14 and SRO#2

Load Case	Nominal %Load Level	Gauge ID							
		75-1	75-2	75-3	75-4	75-5	76-1	76-2	76-3
		Strain (microstrain)							
	0	117	280	221	29	22	132	62	-16
	10	451	689	665	406	220	477	403	249
	20	781	1089	1095	765	404	815	732	499
	30	1105	1481	1515	1114	581	1148	1055	739
	40	1431	1877	1936	1462	757	1479	1377	981
	50	1766	2283	2370	1819	940	1816	1705	1228
-2.4g	60	2109	2703	2816	2185	1126	2161	2042	1482
	70	2454	3126	3267	2551	1311	2508	2380	1736
56deg.	80	2803	3569	3728	2911	1496	2860	2716	1989
Wing	90	3182	4094	4221	3244	1672	3237	3051	2235
Sweep	100	3546	4610	4676	3527	1815	3596	3357	2449
	80	2863	3770	3763	2756	1411	2898	2665	1908
	50	1861	2552	2469	1689	877	1876	1670	1157
	20	883	1374	1226	675	379	883	711	449
	10	565	990	821	345	216	558	398	220
	20	901	1400	1265	720	413	904	739	485
	0	256	618	428	24	59	242	94	-1
	0	276	646	472	91	61	267	135	81
	10	-746	-568	-800	-940	-436	-734	-811	-588
	20	-1738	-1745	-2030	-1940	-927	-1714	-1733	-1237
	30	-2721	-2916	-3257	-2940	-1425	-2680	-2640	-1873
	40	-3716	-4127	-4519	-3943	-1936	-3654	-3548	-2507
	50	-4713	-5354	-5790	-4931	-2446	-4630	-4454	-3135
	60	-5705	-6600	-7068	-5896	-2954	-5602	-5349	-3755
	70	-6670	-7851	-8347	-6801	-3445	-6536	-6204	-4346
	dr. level	184	287	217	270	120	178	104	77
	re-zero	285	403	325	337	135	287	198	127
	0	313	438	363	367	151	317	227	148
	10	-720	-793	-928	-677	-351	-694	-730	-531
+7.33g	20	-1726	-1994	-2190	-1706	-859	-1684	-1665	-1192
	30	-2702	-3156	-3409	-2698	-1349	-2644	-2565	-1822
56deg.	40	-3685	-4329	-4642	-3706	-1857	-3608	-3468	-2450
Wing	50	-4683	-5522	-5892	-4725	-2372	-4583	-4378	-3080
Sweep	60	-5679	-6716	-7139	-5738	-2890	-5555	-5284	-3705
	70	-6678	-7924	-8402	-6749	-3417	-6531	-6190	-4332
	80	-7644	-9136	-9678	-7714	-3920	-7474	-7059	-4931
	90	-8560	-10417	-11316	-8693	-4293	-8405	-7891	-5487
	100	-9427	-12102	-13649	-9662	-4521	-9323	-8773	-5969
	80	-7443	-9746	-11158	-7588	-3441	-7388	-6953	-4682
	50	-4475	-6189	-7394	-4499	-1860	-4481	-4235	-2794
	20	-1535	-2548	-3502	-1485	-365	-1581	-1537	-931
	10	-543	-1263	-2117	-508	99	-601	-632	-312
	20	-1578	-2508	-3439	-1590	-440	-1613	-1594	-1005
	0	440	27	-746	388	487	376	259	276

Table B1: F111 Wing Test - Baseline Configuration
Complete CPLT Load and Strain Histories at FFVH#13, FFVH#14 and SRO#2

Load Case	Nominal %Load Level	Gauge ID							
		76-4	76-5	59/60-1	59/60-2	59/60-3	59/60-4	59/60-5	36\37-1
		Strain (microstrain)							
	0	-92	-30	42	640	781	427	279	14
	10	17	-119	359	1016	1170	749	542	121
	20	114	-214	687	1402	1565	1075	811	231
	30	203	-311	1009	1781	1955	1399	1082	343
	40	297	-403	1350	2182	2368	1740	1364	452
	50	398	-491	1687	2584	2784	2083	1646	563
-2.4g	60	500	-582	2030	2990	3204	2427	1930	677
	70	602	-675	2369	3397	3629	2774	2216	793
56deg.	80	706	-765	2715	3817	4067	3114	2491	907
Wing	90	805	-858	3098	4317	4610	3484	2773	1026
Sweep	100	885	-952	3487	4837	5182	3855	3048	1144
	80	657	-779	2884	4123	4443	3231	2526	917
	50	370	-490	1907	2964	3244	2237	1701	574
	20	113	-192	899	1773	2015	1223	865	236
	10	31	-92	559	1374	1607	887	587	125
	20	139	-183	876	1745	1988	1204	851	235
	0	-47	6	219	973	1193	546	308	16
	0	53	2	130	850	1058	458	240	31
	10	-142	344	-829	-288	-125	-536	-592	-294
	20	-321	693	-1852	-1498	-1381	-1586	-1470	-571
	30	-493	1043	-2929	-2770	-2700	-2685	-2386	-817
	40	-662	1396	-4098	-4162	-4150	-3862	-3364	-1040
	50	-824	1757	-5332	-5649	-5711	-5099	-4387	-1244
	60	-982	2120	-6578	-7183	-7336	-6342	-5402	-1445
	70	-1133	2477	-7792	-8735	-9007	-7552	-6360	-1641
	dr. level	66	75	-126	296	358	303	234	-19
	re-zero	61	15	37	492	560	460	362	34
	0	68	7	70	533	603	490	383	41
	10	-135	345	-897	-621	-599	-515	-457	-284
+7.33g	20	-323	689	-1944	-1863	-1889	-1590	-1352	-566
	30	-493	1034	-3020	-3131	-3201	-2684	-2265	-815
56deg.	40	-658	1384	-4168	-4488	-4608	-3855	-3241	-1035
Wing	50	-818	1745	-5387	-5924	-6096	-5089	-4271	-1238
Sweep	60	-975	2110	-6611	-7376	-7608	-6332	-5307	-1439
	70	-1130	2480	-7840	-8856	-9162	-7584	-6345	-1639
	80	-1277	2842	-9061	-10382	-10790	-8816	-7338	-1835
	90	-1407	3202	-10359	-12173	-12747	-10150	-8277	-2031
	100	-1506	3560	-11879	-14492	-15320	-12034	-9286	-2244
	80	-1163	2840	-9602	-11801	-12522	-9676	-7306	-1837
	50	-683	1761	-6005	-7528	-8075	-5983	-4240	-1228
	20	-202	712	-2469	-3174	-3478	-2370	-1325	-547
	10	-39	365	-1289	-1655	-1850	-1168	-406	-276
	20	-250	697	-2350	-2913	-3152	-2251	-1302	-565
	0	105	3	-179	-180	-239	5	483	19

Table B1: F111 Wing Test - Baseline Configuration
Complete CPLT Load and Strain Histories at FFVH#13, FFVH#14 and SRO#2

Load Case	Nominal %Load Level	Gauge ID			
		36\37-2	36\37-3	36\37-4	36\37-5
		Strain (microstrain)			
	0	40	6	-13	43
	10	136	92	67	121
	20	232	178	148	199
	30	332	268	231	280
	40	428	354	311	356
	50	526	441	391	434
-2.4g	60	627	532	475	514
	70	729	623	559	595
56deg.	80	830	713	642	674
Wing	90	936	805	726	752
Sweep	100	1039	896	806	826
	80	835	713	635	662
	50	531	439	381	417
	20	232	171	133	177
	10	134	83	50	98
	20	231	171	133	178
	0	38	-3	-30	20
	0	54	15	-9	41
	10	-233	-240	-244	-184
	20	-473	-451	-436	-366
	30	-681	-629	-596	-518
	40	-864	-781	-728	-641
	50	-1027	-912	-837	-739
	60	-1186	-1035	-938	-827
	70	-1337	-1150	-1026	-901
	dr. level	17	-7	-18	44
	re-zero	65	35	21	81
	0	71	40	27	87
	10	-217	-215	-208	-136
+7.33g	20	-460	-429	-403	-322
	30	-672	-610	-566	-477
56deg.	40	-853	-762	-698	-601
Wing	50	-1016	-894	-811	-704
Sweep	60	-1174	-1019	-915	-798
	70	-1332	-1142	-1014	-885
	80	-1482	-1255	-1101	-957
	90	-1627	-1355	-1166	-999
	100	-1777	-1440	-1192	-982
	80	-1455	-1188	-987	-803
	50	-974	-808	-674	-523
	20	-415	-348	-280	-164
	10	-187	-154	-112	-9
	20	-438	-375	-312	-200
	0	64	59	74	160

Table B1: F111 Wing Test - Baseline Configuration
Complete CPLT Load and Strain Histories at FFVH#13, FFVH#14 and SRO#2

Load Case	Nominal %Load Level	Actuator ID						Gauge ID	
		Act. E	Act. F	Act. G	Act. H	Act. I	Act. J	72-1	72-2
		Load (kN)						Strain (microstrain)	
	0	0.0	0.0	0.0	-0.1	0.0	0.0	517	211
	10	-12.6	-7.2	0.0	-10.5	0.0	0.0	964	716
	20	-25.2	-14.5	0.0	-20.9	0.0	0.0	1437	1329
	30	-37.7	-21.7	0.0	-31.3	0.0	0.0	1942	2028
	40	-50.3	-28.9	0.0	-41.7	0.0	0.0	2471	2762
	50	-62.9	-36.4	0.0	-52.1	0.0	0.0	3032	3543
-3.0g	60	-75.5	-43.6	0.0	-62.5	0.0	0.0	3604	4336
	70	-88.1	-50.9	0.0	-72.9	0.0	0.0	4203	5182
26deg.	80	-100.6	-58.2	0.0	-83.3	0.0	0.0	4821	6046
Wing	90	-113.2	-65.5	0.0	-93.8	0.0	0.0	5463	6951
Sweep	100	-125.8	-72.8	0.0	-104.2	0.0	0.0	6126	7888
	80	-100.6	-58.2	0.0	-83.4	0.0	0.0	5172	6815
	50	-62.9	-36.4	0.0	-52.3	0.0	0.0	3794	5268
	20	-25.2	-14.7	0.0	-20.9	0.0	0.0	2431	3741
	10	-12.7	-7.4	0.0	-10.5	0.0	0.0	1983	3238
	20	-25.2	-14.7	0.0	-20.9	0.0	0.0	2441	3750
	0	-0.1	-0.1	0.0	-0.1	0.0	0.0	1547	2745
	0	0.0	-0.4	-0.1	-0.2	0.0	0.0	1594.8	2716.1
'X'	20	20.6	26.0	25.1	26.2	0.0	6.4	-879.2	-91.8
+7.33g	40	41.2	52.3	50.0	52.7	0.0	12.7	-3450.4	-3109.2
	60	61.8	78.7	74.9	79.2	0.0	19.1	-6145.5	-6479.7
26deg.	80	82.4	105.1	99.9	105.6	0.0	25.5	-8971.0	-10261
Wing	100	103.0	131.5	124.7	132.0	0.0	31.8	-12030	-14615
Sweep	80	82.4	105.1	100.1	105.6	0.0	25.4	-9565.2	-11825
	20	20.6	26.0	25.0	26.0	0.0	6.4	-1767.8	-2593.7
	0	-0.3	-0.6	-0.5	-0.9	0.0	0.0	939.9	898.6
	0	0.1	-0.1	-0.1	-0.2	0.0	0.0	914	899
	10	10.3	13.1	12.6	13.1	2.0	3.2	-382	-553
	20	20.6	26.4	25.2	26.3	4.0	6.4	-1743	-2110
	30	30.9	39.5	37.7	39.5	6.1	9.5	-3102	-3672
	40	41.2	52.7	50.3	52.9	8.1	12.8	-4468	-5248
	50	51.4	65.9	62.7	66.0	10.1	15.9	-5842	-6838
	60	61.8	79.1	75.2	79.2	12.2	19.1	-7216	-8451
+7.33g	70	72.1	92.3	87.6	92.3	14.2	22.3	-8594	-10112
	80	82.3	105.4	100.0	105.5	16.2	25.5	-9985	-11850
26deg.	90	92.7	118.6	112.5	118.6	18.3	28.6	-11440	-13741
Wing	100	103.0	131.8	124.9	131.8	20.3	31.8	-13146	-16167
Sweep	80	82.4	105.4	100.2	105.4	16.2	25.4	-10520	-13203
	50	51.5	66.0	62.7	65.9	10.1	15.9	-6409	-8461
	20	20.6	26.4	25.0	25.9	4.0	6.3	-2157	-3278
	10	10.2	13.2	12.4	12.7	2.0	3.2	-650	-1325
	20	20.6	26.4	25.3	26.4	4.1	6.4	-1997	-2859
	10	10.2	13.2	12.5	12.7	2.0	3.2	-646	-1312
	0	0.0	-0.1	-0.2	-0.4	0.0	0.0	801	573

Table B1: F111 Wing Test - Baseline Configuration
Complete CPLT Load and Strain Histories at FFVH#13, FFVH#14 and SRO#2

Load Case	Nominal %Load Level	Gauge ID							
		72-3	72-4	72-5	73-1	73-2	73-3	73-4	73-5
		Strain (microstrain)							
	0	-1337	-941	1046	112	180	-128	145	879
	10	-765	-455	1301	533	624	284	411	900
	20	-4	72	1489	968	1093	703	660	941
	30	884	626	1636	1423	1592	1145	911	997
	40	1799	1184	1769	1893	2107	1597	1159	1041
	50	2754	1743	1885	2378	2643	2067	1410	1088
-3.0g	60	3703	2299	2001	2866	3181	2534	1657	1133
	70	4703	2874	2111	3370	3739	3015	1905	1199
26deg.	80	5692	3428	2207	3875	4303	3495	2146	1230
Wing	90	6707	3991	2297	4390	4878	3978	2384	1259
Sweep	100	7744	4559	2383	4919	5471	4471	2620	1284
	80	6528	3524	1838	4032	4527	3586	2037	1232
	50	4800	2093	1124	2751	3180	2351	1253	1179
	20	3108	708	443	1502	1873	1160	502	1131
	10	2546	245	213	1086	1437	763	252	1116
	20	3120	729	467	1512	1887	1182	525	1138
	0	1995	-208	-11	684	1014	375	5	1095
	0	1881	-196	65	695	1008	387	30	1074
'X'	20	-1317	-2946	-1452	-1474	-1234	-1653	-1305	869
+7.33g	40	-4893	-5969	-3130	-3712	-3593	-3838	-2794	513
	60	-9025	-9051	-4558	-6010	-6055	-6074	-4258	146
26deg.	80	-13775	-12317	-5790	-8376	-8632	-8382	-5705	-188
Wing	100	-19494	-15994	-6750	-10877	-11396	-10862	-7126	-472
Sweep	80	-16295	-13192	-5141	-8710	-9132	-8762	-5701	-193
	20	-5190	-3824	-117	-1933	-1963	-2113	-1185	1140
	0	-793	-646	1122	348	470	60	175	1930
	0	-791	-685	1051	327	457	36	151	2130
	10	-2426	-2067	319	-815	-716	-1017	-513	2064
	20	-4226	-3635	-565	-1996	-1940	-2138	-1261	1910
	30	-6049	-5232	-1475	-3179	-3177	-3281	-2034	1723
	40	-7888	-6838	-2381	-4380	-4440	-4450	-2825	1528
	50	-9753	-8447	-3279	-5578	-5698	-5613	-3611	1359
	60	-11673	-10056	-4149	-6772	-6959	-6780	-4402	1237
+7.33g	70	-13702	-11690	-4985	-7975	-8232	-7953	-5191	1160
	80	-15881	-13364	-5763	-9179	-9515	-9130	-5977	956
26deg.	90	-18316	-15130	-6463	-10419	-10849	-10341	-6762	974
Wing	100	-21651	-17246	-6923	-11812	-12366	-11739	-7528	1263
Sweep	80	-18259	-14264	-5204	-9497	-9951	-9504	-6014	1542
	50	-12690	-9400	-2444	-5914	-6183	-5997	-3616	3577
	20	-6255	-4229	79	-2230	-2275	-2412	-1239	5988
	10	-3758	-2409	793	-956	-911	-1184	-463	6688
	20	-5535	-3961	-80	-2158	-2165	-2336	-1221	6541
	10	-3741	-2406	782	-957	-908	-1181	-463	6719
	0	-1386	-797	1327	249	361	-79	186	7073

Table B1: F111 Wing Test - Baseline Configuration
Complete CPLT Load and Strain Histories at FFVH#13, FFVH#14 and SRO#2

Load Case	Nominal %Load Level	Gauge ID							
		75-1	75-2	75-3	75-4	75-5	76-1	76-2	76-3
		Strain (microstrain)							
	0	364	-26	-786	311	437	351	209	204
	10	784	486	-233	772	674	782	632	531
	20	1170	1003	329	1154	851	1190	1016	806
	30	1579	1579	960	1555	1039	1614	1414	1095
	40	2009	2195	1634	1971	1233	2051	1826	1396
	50	2451	2839	2337	2391	1424	2500	2244	1699
-3.0g	60	2896	3494	3046	2809	1611	2952	2664	2002
	70	3354	4177	3782	3234	1800	3415	3090	2309
26deg.	80	3818	4870	4512	3645	1979	3880	3510	2606
Wing	90	4299	5586	5257	4059	2157	4358	3931	2903
Sweep	100	4793	6324	6015	4473	2332	4845	4354	3200
	80	3914	5238	4832	3482	1818	3950	3467	2499
	50	2647	3698	3193	2153	1169	2668	2219	1557
	20	1414	2204	1611	881	556	1419	1014	661
	10	1006	1711	1088	461	354	1007	617	369
	20	1430	2226	1643	925	592	1439	1042	698
	0	612	1231	578	53	156	604	230	86
	0	647	1226	552	119	189	642	282	157
'X'	20	-1261	-1051	-1847	-1829	-766	-1227	-1487	-1103
+7.33g	40	-3125	-3322	-4257	-3738	-1723	-3056	-3205	-2312
	60	-4997	-5733	-6830	-5588	-2652	-4893	-4902	-3485
26deg.	80	-6869	-8282	-9557	-7381	-3544	-6739	-6572	-4614
Wing	100	-8759	-11077	-12599	-9128	-4360	-8615	-8231	-5690
Sweep	80	-6867	-8821	-10214	-7149	-3332	-6770	-6492	-4453
	20	-1262	-2000	-2954	-1304	-354	-1278	-1346	-854
	0	595	381	-419	483	476	557	347	291
	0	568	342	-454	431	456	522	312	222
	10	-454	-878	-1735	-599	-34	-478	-633	-446
	20	-1462	-2080	-2999	-1623	-532	-1470	-1569	-1103
	30	-2455	-3264	-4243	-2627	-1019	-2445	-2485	-1742
	40	-3462	-4472	-5516	-3660	-1531	-3428	-3407	-2384
	50	-4462	-5673	-6784	-4688	-2046	-4406	-4320	-3016
	60	-5457	-6875	-8053	-5710	-2562	-5379	-5229	-3644
+7.33g	70	-6447	-8084	-9332	-6722	-3077	-6349	-6131	-4264
	80	-7429	-9305	-10632	-7718	-3587	-7313	-7023	-4876
26deg.	90	-8417	-10578	-11995	-8700	-4088	-8282	-7913	-5482
Wing	100	-9444	-12132	-13661	-9650	-4508	-9280	-8811	-6029
Sweep	80	-7429	-9739	-11136	-7557	-3426	-7316	-6964	-4724
	50	-4425	-6138	-7326	-4430	-1826	-4380	-4214	-2806
	20	-1435	-2444	-3393	-1369	-308	-1443	-1479	-917
	10	-424	-1143	-2006	-380	158	-450	-559	-292
	20	-1469	-2403	-3342	-1472	-385	-1469	-1530	-989
	10	-425	-1141	-2002	-381	157	-450	-562	-296
	0	563	147	-651	516	545	527	334	300

Table B1: F111 Wing Test - Baseline Configuration
Complete CPLT Load and Strain Histories at FFVH#13, FFVH#14 and SRO#2

Load Case	Nominal %Load Level	Gauge ID							
		76-4	76-5	59/60-1	59/60-2	59/60-3	59/60-4	59/60-5	36\37-1
		Strain (microstrain)							
	0	145	27	-66	-97	-145	37	477	-1
	10	273	-90	345	391	358	452	819	135
	20	363	-225	813	997	1007	919	1170	273
	30	470	-345	1295	1647	1711	1403	1519	411
	40	588	-459	1793	2322	2444	1904	1875	552
	50	707	-576	2302	3018	3206	2424	2240	697
-3.0g	60	825	-694	2802	3702	3955	2936	2599	845
	70	947	-811	3315	4409	4730	3459	2960	994
26deg.	80	1063	-928	3830	5119	5513	3988	3328	1144
Wing	90	1180	-1045	4359	5844	6310	4521	3696	1295
Sweep	100	1298	-1160	4894	6580	7124	5064	4070	1448
	80	1002	-942	4113	5652	6157	4250	3388	1159
	50	652	-575	2852	4153	4605	2965	2323	726
	20	335	-195	1588	2640	3031	1661	1247	293
	10	234	-67	1155	2126	2499	1223	888	150
	20	363	-186	1564	2612	3002	1645	1239	291
	0	136	58	717	1608	1966	788	531	11
	0	159	52	589	1405	1739	657	452	51
'X'	20	-220	680	-1258	-790	-542	-1252	-1142	-498
+7.33g	40	-563	1322	-3376	-3320	-3177	-3403	-2920	-931
	60	-883	1978	-5735	-6266	-6306	-5786	-4823	-1307
26deg.	80	-1177	2647	-8182	-9462	-9755	-8261	-6699	-1683
Wing	100	-1440	3329	-10772	-13020	-13657	-10960	-8588	-2063
Sweep	80	-1099	2655	-8595	-10454	-10999	-8728	-6718	-1681
	20	-120	698	-1942	-2457	-2646	-1924	-1117	-475
	0	185	41	189	280	290	264	587	39
	0	135	15	194	263	286	251	575	31
	10	-61	355	-775	-894	-922	-763	-272	-284
	20	-243	706	-1836	-2158	-2235	-1860	-1185	-565
	30	-413	1062	-2941	-3469	-3597	-2996	-2129	-814
	40	-583	1418	-4143	-4879	-5045	-4192	-3119	-1035
	50	-747	1776	-5365	-6326	-6549	-5441	-4157	-1238
	60	-906	2138	-6600	-7797	-8081	-6702	-5204	-1438
+7.33g	70	-1059	2503	-7838	-9295	-9659	-7974	-6251	-1636
	80	-1206	2869	-9079	-10838	-11301	-9252	-7281	-1834
26deg.	90	-1349	3241	-10354	-12483	-13077	-10572	-8310	-2034
Wing	100	-1463	3623	-11825	-14530	-15339	-12185	-9402	-2247
Sweep	80	-1122	2885	-9481	-11762	-12468	-9768	-7374	-1835
	50	-629	1800	-5844	-7437	-7963	-6018	-4254	-1217
	20	-140	740	-2252	-3023	-3306	-2348	-1292	-534
	10	24	386	-1078	-1514	-1687	-1145	-361	-262
	20	-191	720	-2164	-2793	-2997	-2221	-1243	-551
	10	22	387	-1073	-1506	-1675	-1138	-355	-262
	0	167	23	55	-19	-56	47	549	29

Table B1: F111 Wing Test - Baseline Configuration
Complete CPLT Load and Strain Histories at FFVH#13, FFVH#14 and SRO#2

Load Case	Nominal %Load Level	Gauge ID			
		36\37-2	36\37-3	36\37-4	36\37-5
		Strain (microstrain)			
	0	44	37	49	136
	10	165	144	149	232
	20	285	250	244	322
	30	404	353	336	406
	40	527	459	429	492
	50	653	568	525	579
-3.0g	60	781	679	622	668
	70	910	791	720	756
26deg.	80	1041	903	818	845
Wing	90	1172	1016	917	934
Sweep	100	1306	1132	1017	1025
	80	1049	900	802	818
	50	664	556	484	513
	20	281	213	167	209
	10	156	101	64	110
	20	280	212	167	209
	0	33	-9	-38	12
	0	55	-1	5	29
'X'	20	-423	-423	-379	-337
+7.33g	40	-784	-726	-645	-586
	60	-1080	-957	-831	-747
26deg.	80	-1367	-1169	-986	-868
Wing	100	-1649	-1362	-1108	-939
Sweep	80	-1348	-1125	-913	-768
	20	-373	-335	-246	-164
	0	62	33	76	132
	0	48	23	63	119
	10	-229	-222	-161	-94
	20	-471	-433	-352	-275
	30	-681	-613	-511	-426
	40	-862	-762	-641	-546
	50	-1024	-892	-751	-646
	60	-1181	-1016	-852	-735
+7.33g	70	-1335	-1134	-946	-816
	80	-1487	-1248	-1033	-887
26deg.	90	-1638	-1357	-1111	-947
Wing	100	-1793	-1458	-1166	-968
Sweep	80	-1469	-1205	-961	-791
	50	-982	-822	-648	-514
	20	-423	-364	-257	-158
	10	-193	-169	-89	-5
	20	-444	-389	-288	-193
	10	-193	-170	-90	-6
	0	53	40	93	160

Table B2: F111 Wing Test - Intermediate Configuration
Complete CPLT Load and Strain Histories at FFVH#13, FFVH#14 and SRO#2

Load Case	Nominal %Load Level	Actuator ID						Gauge ID	
		Act. E	Act. F	Act. G	Act. H	Act. I	Act. J	72-1	72-2
		Load (kN)						Strain (microstrain)	
	0	0.1	0.0	0.0	0.1	0.0	0.0	-25	-8
	10	13.8	0.0	0.0	10.6	0.0	0.0	-49	0
	20	27.6	0.0	0.0	20.9	0.0	0.0	-69	11
	30	41.3	0.0	0.0	31.2	0.0	0.0	-89	23
	40	55.1	0.0	0.0	41.6	0.0	0.0	-112	32
	50	68.9	0.0	0.0	52.1	0.0	0.0	-132	45
-2.4g	60	82.7	0.0	0.0	62.5	0.0	0.0	-151	59
	70	96.5	0.0	0.0	73.0	0.0	0.0	-171	73
56deg.	80	110.2	0.0	0.0	83.4	0.0	0.0	-188	87
Wing	90	124.0	0.0	0.0	93.7	0.0	0.0	-208	101
Sweep	100	137.8	0.0	0.0	104.2	0.0	0.0	-229	113
	80	109.9	0.0	0.0	83.2	0.0	0.0	-171	102
	50	69.5	0.0	0.0	52.0	0.0	0.0	-128	48
	20	27.6	0.0	0.0	20.7	0.0	0.0	-84	-7
	10	13.8	0.0	0.0	10.6	0.0	0.0	-71	-25
	20	27.5	0.0	0.0	20.7	0.0	0.0	-95	-15
	0	0.0	0.0	0.0	-0.1	0.0	0.0	-56	-40
	0	0.0	0.0	0.0	0.0	0.0	0.0	-58	-42
	10	-10.3	-13.1	-13.0	-13.1	-2.0	-3.1	-102	-202
	20	-20.6	-26.3	-25.8	-26.3	-4.1	-6.3	-105	-329
	30	-30.8	-39.5	-38.3	-39.4	-6.1	-9.5	-97	-446
	40	-41.1	-52.7	-50.8	-52.7	-8.2	-12.6	-88	-561
	50	-51.4	-66.0	-63.2	-65.9	-10.2	-15.8	-83	-677
+7.33g	60	-61.7	-79.3	-75.7	-79.2	-12.2	-19.0	-88	-804
	70	-72.0	-92.5	-88.2	-92.4	-14.3	-22.2	-94	-930
56deg.	80	-82.2	-105.6	-100.7	-105.6	-16.3	-25.3	-103	-1057
Wing	90	-92.5	-118.8	-113.2	-118.8	-18.3	-28.5	-115	-1182
Sweep	100	-102.8	-132.1	-125.7	-131.9	-20.4	-31.7	-126	-1300
	80	-82.2	-105.6	-100.7	-105.5	-16.1	-25.3	-64	-1009
	50	-51.4	-66.0	-63.2	-65.9	-10.0	-15.8	-48	-628
	20	-20.6	-26.4	-25.6	-26.1	-3.9	-6.3	-65	-272
	10	-10.3	-13.2	-12.9	-13.0	-1.9	-3.1	-65	-149
	20	-20.6	-26.4	-25.5	-26.2	-4.1	-6.3	-94	-303
	0	-0.1	-0.1	0.0	0.0	0.0	0.0	-42	-10

Table B2: F111 Wing Test - Intermediate Configuration
Complete CPLT Load and Strain Histories at FFVH#13, FFVH#14 and SRO#2

Load Case	Nominal %Load Level	Gauge ID							
		72-3	72-4	72-5	258-1	258-2	258-3	258-4	258-5
		Strain (microstrain)							
	0	-11	245	-15	223	204	188	165	-50
	10	50	382	96	578	542	497	451	33
	20	113	524	210	932	874	800	731	111
	30	177	667	324	1290	1208	1101	1004	184
	40	241	813	440	1665	1558	1415	1286	259
	50	310	966	562	2045	1913	1731	1565	329
-2.4g	60	378	1119	682	2426	2270	2048	1840	397
	70	448	1274	805	2812	2632	2371	2118	464
56deg.	80	518	1426	925	3196	2993	2693	2394	529
Wing	90	588	1580	1046	3585	3360	3022	2674	593
Sweep	100	656	1730	1166	3980	3735	3359	2963	659
	80	530	1435	931	3189	2981	2671	2323	475
	50	307	955	560	2090	1950	1744	1489	260
	20	83	475	185	989	921	825	667	52
	10	11	320	64	632	588	526	401	-16
	20	76	471	184	1014	950	856	705	72
	0	-57	173	-52	283	260	232	135	-85
	0	-56	151	-35	291	269	245	142	-42
	10	-427	-546	-551	-1008	-959	-874	-895	-348
	20	-753	-1161	-1048	-2383	-2281	-2104	-2071	-722
	30	-1037	-1597	-1519	-3815	-3665	-3402	-3329	-1147
	40	-1295	-1875	-1967	-5250	-5045	-4687	-4568	-1564
	50	-1540	-2050	-2394	-6628	-6365	-5914	-5750	-1961
+7.33g	60	-1807	-2202	-2831	-8029	-7697	-7133	-6912	-2354
	70	-2065	-2309	-3257	-9732	-9204	-8342	-7989	-2699
56deg.	80	-2322	-2389	-3673	-12127	-11076	-9555	-8829	-2905
Wing	90	-2571	-2444	-4074	-15055	-13348	-10964	-9526	-2982
Sweep	100	-2808	-2482	-4451	-18587	-16295	-12921	-10408	-2974
	80	-2238	-2289	-3596	-15925	-13748	-10553	-8129	-2234
	50	-1442	-1900	-2298	-11580	-9575	-6682	-4409	-996
	20	-641	-992	-947	-6824	-5098	-2694	-754	163
	10	-327	-402	-457	-5041	-3472	-1326	409	499
	20	-688	-1051	-985	-6488	-4853	-2600	-797	117
	0	8	250	30	-3349	-1972	-116	1373	735

Table B2: F111 Wing Test - Intermediate Configuration
Complete CPLT Load and Strain Histories at FFVH#13, FFVH#14 and SRO#2

Load Case	Nominal %Load Level	Gauge ID							
		259-1	259-2	259-3	259-4	259-5	73-1	73-2	73-3
		Strain (microstrain)							
	0	-45	-164	-156	-79	-46	146	159	170
	10	-143	-429	-403	-191	-108	419	438	454
	20	-246	-692	-648	-302	-167	696	719	738
	30	-356	-961	-893	-413	-226	978	1000	1023
	40	-475	-1241	-1151	-529	-289	1271	1291	1320
	50	-600	-1524	-1406	-642	-349	1572	1585	1620
-2.4g	60	-729	-1806	-1659	-754	-409	1875	1877	1919
	70	-861	-2091	-1913	-867	-468	2182	2170	2220
56deg.	80	-993	-2373	-2165	-979	-527	2485	2460	2518
Wing	90	-1128	-2656	-2418	-1090	-585	2789	2749	2816
Sweep	100	-1264	-2942	-2675	-1205	-648	3099	3040	3118
	80	-1038	-2348	-2117	-947	-504	2491	2415	2476
	50	-678	-1527	-1385	-628	-340	1621	1527	1575
	20	-308	-704	-655	-312	-180	752	644	683
	10	-191	-439	-421	-210	-128	473	361	396
	20	-297	-721	-682	-329	-193	763	658	699
	0	-75	-174	-183	-106	-74	191	74	105
	0	-73	-183	-197	-112	-78	203	87	119
	10	203	611	482	144	12	-762	-884	-851
	20	427	1460	1262	467	153	-1765	-1898	-1873
	30	611	2319	2070	808	308	-2776	-2920	-2905
	40	797	3175	2876	1148	463	-3790	-3942	-3939
	50	972	4003	3660	1477	611	-4782	-4927	-4931
+7.33g	60	1149	4828	4432	1793	749	-5773	-5900	-5908
	70	1347	5648	5197	2106	884	-6744	-6846	-6847
56deg.	80	1662	6472	5942	2401	1011	-7681	-7765	-7797
Wing	90	2125	7330	6657	2677	1128	-8612	-8852	-8932
Sweep	100	2730	8183	7281	2914	1231	-9772	-10206	-10199
	80	2396	6651	5902	2381	1029	-7797	-8196	-8165
	50	1915	4213	3597	1431	617	-4744	-5084	-5015
	20	1298	1703	1221	430	165	-1696	-1979	-1884
	10	1035	856	437	103	20	-675	-942	-842
	20	1269	1688	1186	398	135	-1710	-1992	-1899
	0	710	61	-255	-170	-89	293	36	130

Table B2: F111 Wing Test - Intermediate Configuration
Complete CPLT Load and Strain Histories at FFVH#13, FFVH#14 and SRO#2

Load Case	Nominal %Load Level	Gauge ID							
		73-4	73-5	260-1	260-2	260-3	260-4	260-5	75-1
		Strain (microstrain)							
	0	201	244	163	-7	-142	-177	-118	163
	10	498	596	374	-63	-392	-460	-292	468
	20	794	947	585	-114	-631	-734	-462	771
	30	1093	1300	795	-170	-879	-1015	-635	1079
	40	1405	1673	1016	-237	-1153	-1323	-824	1413
	50	1720	2048	1234	-311	-1432	-1631	-1010	1756
-2.4g	60	2037	2426	1452	-387	-1714	-1942	-1196	2101
	70	2355	2808	1670	-466	-1998	-2255	-1386	2450
56deg.	80	2671	3187	1887	-544	-2280	-2566	-1574	2802
Wing	90	2988	3571	2106	-624	-2564	-2879	-1765	3166
Sweep	100	3311	3962	2330	-703	-2854	-3199	-1962	3538
	80	2632	3145	1852	-538	-2231	-2509	-1546	2822
	50	1692	2033	1225	-306	-1406	-1612	-1013	1795
	20	764	942	605	-94	-620	-755	-503	814
	10	465	590	403	-25	-363	-472	-334	494
	20	784	970	624	-103	-653	-791	-523	832
	0	162	232	198	45	-102	-185	-163	171
	0	178	252	213	44	-117	-204	-172	184
	10	-816	-905	-479	170	582	577	293	-789
	20	-1877	-2162	-1290	250	1331	1466	846	-1807
	30	-2950	-3436	-2131	306	2070	2357	1406	-2806
	40	-4026	-4715	-2987	362	2829	3274	1982	-3802
	50	-5048	-5938	-3826	403	3574	4185	2554	-4781
+7.33g	60	-6053	-7180	-4646	448	4328	5101	3121	-5771
	70	-7009	-8680	-5404	492	5090	6039	3700	-6756
56deg.	80	-8087	-10487	-6077	556	5880	7050	4297	-7737
Wing	90	-9359	-12585	-6774	667	6706	8226	4910	-8710
Sweep	100	-10706	-14940	-7647	930	7602	9572	5496	-9630
	80	-8581	-12410	-5972	817	6069	7776	4437	-7598
	50	-5286	-8427	-3340	708	3783	4986	2719	-4587
	20	-2003	-4305	-825	525	1513	2207	993	-1619
	10	-907	-2855	-28	446	770	1294	428	-627
	20	-2002	-4153	-812	586	1568	2192	958	-1688
	0	110	-1491	648	330	79	476	-59	338

Table B2: F111 Wing Test - Intermediate Configuration
Complete CPLT Load and Strain Histories at FFVH#13, FFVH#14 and SRO#2

Load Case	Nominal %Load Level	Gauge ID							
		75-2	75-3	75-4	75-5	76-1	76-2	76-3	76-4
		Strain (microstrain)							
	0	211	272	266	153	184	181	134	112
	10	586	686	625	352	522	510	380	207
	20	961	1097	970	536	861	834	613	287
	30	1348	1525	1323	727	1202	1162	848	375
	40	1771	1999	1713	944	1559	1510	1110	486
	50	2213	2496	2112	1161	1926	1867	1377	602
-2.4g	60	2671	3018	2514	1373	2298	2227	1643	718
	70	3159	3591	2912	1573	2680	2589	1902	830
56deg.	80	3688	4202	3296	1761	3067	2950	2154	940
Wing	90	4247	4837	3679	1945	3462	3316	2401	1052
Sweep	100	4830	5496	4066	2131	3864	3687	2648	1167
	80	3928	4478	3170	1617	3094	2918	2042	881
	50	2657	3083	1981	971	1990	1840	1242	549
	20	1452	1767	867	370	946	826	503	252
	10	1057	1333	497	169	599	489	258	155
	20	1479	1805	913	406	965	853	541	284
	0	660	900	131	-28	253	156	21	65
	0	671	906	151	-5	265	173	55	68
	10	-505	-359	-910	-568	-741	-770	-575	-124
	20	-1745	-1712	-2058	-1209	-1796	-1773	-1271	-366
	30	-2971	-3056	-3191	-1834	-2843	-2764	-1962	-591
	40	-4210	-4427	-4328	-2470	-3879	-3739	-2634	-810
	50	-5447	-5806	-5437	-3084	-4901	-4694	-3268	-1010
+7.33g	60	-6721	-7232	-6546	-3700	-5940	-5659	-3926	-1212
	70	-8032	-8716	-7643	-4305	-6978	-6613	-4564	-1406
56deg.	80	-9386	-10262	-8735	-476370	-8021	-7564	-5190	-1593
Wing	90	-10791	-11906	-9857	-472660	-9085	-8525	-5810	-1778
Sweep	100	-12215	-13690	-11192	-467140	-10176	-9520	-6397	-1948
	80	-9753	-11008	-8863	-474560	-8091	-7550	-4999	-1506
	50	-6075	-6979	-5386	-2765	-4969	-4618	-2988	-890
	20	-2347	-2830	-1957	-886	-1858	-1708	-1030	-275
	10	-1052	-1365	-832	-302	-808	-731	-387	-68
	20	-2352	-2788	-2051	-973	-1903	-1777	-1128	-336
	0	224	67	205	201	227	221	211	107

Table B2: F111 Wing Test - Intermediate Configuration
Complete CPLT Load and Strain Histories at FFVH#13, FFVH#14 and SRO#2

Load Case	Nominal %Load Level	Gauge ID							
		76-5	59\60-1	59\60-2	59\60-3	59\60-4	59\60-5	36\37-1	36\37-2
		Strain (microstrain)							
	0	2	115	134	153	152	164	59	60
	10	-97	366	408	457	479	501	168	157
	20	-209	627	694	774	824	858	276	252
	30	-310	889	981	1095	1175	1221	387	351
	40	-396	1153	1271	1420	1535	1594	502	452
	50	-484	1415	1560	1746	1898	1970	621	557
-2.4g	60	-572	1675	1848	2073	2265	2350	740	662
	70	-662	1938	2141	2412	2647	2748	861	768
56deg.	80	-750	2193	2429	2760	3046	3166	983	875
Wing	90	-839	2445	2716	3115	3479	3619	1107	984
Sweep	100	-927	2694	3000	3471	3934	4107	1233	1094
	80	-766	2232	2488	2898	3307	3453	992	879
	50	-476	1491	1670	1984	2305	2409	632	557
	20	-190	713	812	1029	1262	1326	264	231
	10	-92	456	531	716	922	974	146	127
	20	-178	703	802	1017	1249	1312	266	232
	0	7	190	238	391	566	606	32	24
	0	5	192	241	393	568	609	35	28
	10	337	-539	-568	-512	-424	-428	-285	-255
	20	662	-1388	-1496	-1541	-1547	-1592	-565	-495
	30	1010	-2232	-2419	-2566	-2667	-2756	-841	-730
	40	1348	-3159	-3421	-3676	-3881	-4013	-1080	-928
	50	1688	-4093	-4428	-4798	-5127	-5305	-1293	-1098
+7.33g	60	2041	-4973	-5379	-5865	-6334	-6555	-1520	-1281
	70	2395	-5839	-6320	-6941	-7584	-7859	-1743	-1457
56deg.	80	2750	-6688	-7250	-8021	-8878	-9231	-1965	-1630
Wing	90	3106	-7518	-8166	-9110	-10203	-10621	-2195	-1808
Sweep	100	3458	-8298	-9052	-10192	-11511	-11937	-2443	-2005
	80	2747	-6573	-7162	-8094	-9224	-9552	-1985	-1636
	50	1684	-3804	-4148	-4757	-5590	-5781	-1308	-1091
	20	656	-1155	-1260	-1532	-2025	-2079	-557	-465
	10	317	-343	-364	-510	-862	-863	-261	-211
	20	643	-1129	-1231	-1476	-1918	-1965	-576	-487
	0	-33	433	496	484	288	342	51	56

Table B2: F111 Wing Test - Intermediate Configuration
Complete CPLT Load and Strain Histories at FFVH#13, FFVH#14 and SRO#2

Load Case	Nominal %Load Level	Gauge ID		
		36\37-3	36\37-4	36\37-5
		Strain (microstrain)		
	0	55	53	51
	10	143	135	131
	20	228	215	207
	30	317	296	285
	40	407	379	364
	50	500	465	445
-2.4g	60	594	550	525
	70	688	636	604
56deg.	80	782	719	682
Wing	90	877	804	760
Sweep	100	973	889	837
	80	778	707	663
	50	488	439	406
	20	195	166	145
	10	100	79	62
	20	196	168	147
	0	8	-7	-21
	0	12	-3	-17
	10	-239	-232	-232
	20	-447	-420	-408
	30	-651	-602	-579
	40	-817	-746	-710
	50	-952	-859	-809
+7.33g	60	-1100	-981	-915
	70	-1237	-1088	-1003
56deg.	80	-1367	-1186	-1079
Wing	90	-1500	-1282	-1147
Sweep	100	-1649	-1390	-1219
	80	-1354	-1148	-1011
	50	-915	-782	-691
	20	-389	-327	-278
	10	-172	-134	-102
	20	-415	-356	-311
	0	59	70	84

Table B2: F111 Wing Test - Intermediate Configuration
Complete CPLT Load and Strain Histories at FFVH#13, FFVH#14 and SRO#2

Load Case	Nominal %Load Level	Actuator ID						Gauge ID	
		Act. E	Act. F	Act. G	Act. H	Act. I	Act. J	72-1	72-2
		Load (kN)						Strain (microstrain)	
	0	0.0	0.0	0.0	0.1	0.0	0.0	-38	-9
	10	12.6	7.1	0.0	10.5	0.0	0.0	-64	5
	20	25.2	14.4	0.0	20.9	0.0	0.0	-93	16
	30	37.6	21.7	0.0	31.3	0.0	0.0	-118	32
	40	50.2	28.9	0.0	41.7	0.0	0.0	-141	49
	50	62.8	36.1	0.0	52.1	0.0	0.0	-163	68
-3.0g	60	75.4	43.3	0.0	62.5	0.0	0.0	-186	86
	70	88.0	50.5	0.0	73.0	0.0	0.0	-206	106
26deg.	80	100.5	57.7	0.0	83.3	0.0	0.0	-223	129
Wing	90	113.1	64.9	0.0	93.8	0.0	0.0	-239	154
Sweep	100	125.6	72.0	0.0	104.2	0.0	0.0	-257	175
	80	100.5	57.8	0.0	83.3	0.0	0.0	-198	150
	50	62.8	36.2	0.0	52.1	0.0	0.0	-144	80
	20	25.2	14.6	0.0	20.9	0.0	0.0	-99	3
	10	12.5	7.3	0.0	10.5	0.0	0.0	-85	-23
	20	25.1	14.5	0.0	20.9	0.0	0.0	-110	-6
	0	0.0	0.1	0.0	0.1	0.0	0.0	-70	-47
	0	-0.1	0.0	-0.1	0.2	0.0	0.0	-75	-53
	10	-10.5	-13.1	-13.1	-12.8	0.0	-3.1	-119	-207
	20	-20.8	-26.3	-25.9	-26.3	-4.0	-6.3	-128	-351
	30	-31.1	-39.3	-38.4	-39.5	-6.1	-9.5	-122	-469
	40	-41.3	-52.8	-50.8	-52.7	-8.1	-12.6	-120	-593
	50	-51.6	-66.1	-63.3	-66.0	-10.1	-15.8	-124	-722
	60	-61.8	-79.3	-75.8	-79.2	-12.1	-19.0	-134	-854
+7.33g	70	-72.1	-92.5	-88.3	-92.4	-14.2	-22.2	-145	-984
	80	-82.3	-105.6	-100.7	-105.6	-16.2	-25.3	-155	-1113
26deg.	90	-92.6	-118.8	-113.2	-118.8	-18.2	-28.5	-163	-1239
Wing	100	-102.8	-132.0	-125.7	-132.0	-20.2	-31.7	-172	-1362
Sweep	80	-82.3	-105.6	-100.7	-105.5	-16.2	-25.3	-97	-1057
	50	-51.5	-66.1	-63.2	-65.9	-10.1	-15.8	-72	-664
	20	-20.8	-26.5	-25.6	-26.2	-4.0	-6.3	-79	-294
	10	-10.6	-13.3	-13.0	-13.0	-2.0	-3.1	-77	-165
	20	-21.0	-26.5	-25.6	-26.2	-4.0	-6.3	-108	-321
	0	-0.4	0.0	-0.1	0.1	0.0	0.1	-56	-26

Table B2: F111 Wing Test - Intermediate Configuration
Complete CPLT Load and Strain Histories at FFVH#13, FFVH#14 and SRO#2

Load Case	Nominal %Load Level	Gauge ID							
		72-3	72-4	72-5	258-1	258-2	258-3	258-4	258-5
		Strain (microstrain)							
	0	-1	166	25	-3342	-1987	-163	1266	685
	10	80	349	171	-2869	-1543	233	1621	779
	20	161	543	315	-2275	-1023	644	1939	846
	30	243	715	461	-1657	-484	1070	2269	917
	40	327	898	608	-998	75	1491	2571	968
	50	414	1088	759	-307	650	1911	2858	1009
-3.0g	60	502	1280	911	372	1221	2339	3164	1062
	70	592	1475	1064	1074	1802	2762	3452	1103
26deg.	80	687	1698	1219	1772	2373	3173	3725	1135
Wing	90	777	1869	1371	2485	2959	3596	4006	1172
Sweep	100	871	2074	1523	3217	3557	4024	4288	1203
	80	698	1683	1221	2242	2634	3189	3525	999
	50	413	1077	750	823	1310	2012	2481	740
	20	125	469	280	-564	23	875	1482	500
	10	31	271	125	-1023	-403	498	1152	419
	20	117	463	277	-551	43	903	1522	523
	0	-56	107	-21	-1471	-820	129	826	339
	0	-62	206	-78	-1548	-879	82	830	211
	10	-414	-459	-567	-2777	-2041	-974	-146	-76
	20	-776	-1138	-1114	-4309	-3503	-2318	-1414	-471
	30	-1063	-1584	-1589	-5804	-4932	-3628	-2657	-876
	40	-1332	-1878	-2051	-7365	-6396	-4943	-3880	-1268
	50	-1596	-2069	-2497	-8972	-7879	-6240	-5057	-1637
	60	-1863	-2215	-2938	-10636	-9393	-7532	-6197	-1988
+7.33g	70	-2127	-2320	-3368	-12406	-10972	-8837	-7303	-2315
	80	-2386	-2400	-3787	-14297	-12629	-10159	-8365	-2611
26deg.	90	-2640	-2464	-4197	-16384	-14428	-11539	-9394	-2867
Wing	100	-2887	-2514	-4594	-18923	-16616	-13141	-10404	-3033
Sweep	80	-2305	-2324	-3724	-16240	-14056	-10771	-8140	-2314
	50	-1497	-1941	-2410	-11862	-9855	-6880	-4410	-1089
	20	-678	-1003	-1029	-7073	-5331	-2828	-687	86
	10	-354	-391	-528	-5282	-3685	-1430	510	431
	20	-715	-1048	-1054	-6717	-5055	-2691	-681	59
	0	-11	273	-29	-3560	-2141	-165	1533	690

Table B2: F111 Wing Test - Intermediate Configuration
Complete CPLT Load and Strain Histories at FFVH#13, FFVH#14 and SRO#2

Load Case	Nominal %Load Level	Gauge ID							
		259-1	259-2	259-3	259-4	259-5	73-1	73-2	73-3
		Strain (microstrain)							
	0	692	88	-238	-158	-82	262	-8	81
	10	551	-252	-551	-299	-157	623	362	458
	20	388	-592	-856	-437	-234	980	725	824
	30	218	-943	-1170	-577	-308	1348	1100	1203
	40	28	-1296	-1479	-715	-381	1720	1478	1584
	50	-175	-1650	-1783	-848	-451	2098	1861	1970
-3.0g	60	-371	-2012	-2095	-987	-524	2483	2251	2362
	70	-576	-2368	-2397	-1119	-593	2867	2637	2752
26deg.	80	-783	-2715	-2686	-1244	-657	3245	3014	3132
Wing	90	-992	-3070	-2981	-1372	-721	3628	3397	3519
Sweep	100	-1203	-3424	-3276	-1500	-787	4010	3777	3906
	80	-904	-2701	-2610	-1198	-624	3259	3005	3117
	50	-430	-1663	-1688	-795	-419	2155	1877	1975
	20	48	-654	-798	-413	-229	1071	772	858
	10	206	-322	-505	-287	-165	712	407	489
	20	65	-670	-825	-430	-241	1081	785	874
	0	355	0	-217	-162	-103	362	50	128
	0	350	-45	-230	-174	-114	349	37	116
	10	620	700	405	63	-33	-566	-887	-808
	20	872	1600	1238	406	115	-1660	-1997	-1926
	30	1080	2452	2045	747	269	-2678	-3031	-2969
	40	1300	3309	2850	1083	419	-3712	-4081	-4030
	50	1521	4145	3631	1406	559	-4738	-5121	-5078
	60	1744	4970	4393	1717	691	-5759	-6153	-6117
+7.33g	70	1978	5789	5145	2023	822	-6779	-7182	-7152
	80	2232	6570	5881	2321	949	-7795	-8208	-8182
26deg.	90	2519	7367	6610	2617	1076	-8828	-9251	-9227
Wing	100	2902	8128	7295	2891	1194	-9945	-10373	-10325
Sweep	80	2530	6594	5921	2368	1004	-7955	-8347	-8279
	50	2013	4165	3614	1422	599	-4881	-5214	-5109
	20	1385	1677	1224	417	150	-1781	-2063	-1932
	10	1122	840	435	87	5	-737	-1007	-872
	20	1360	1656	1173	376	116	-1765	-2049	-1920
	0	804	48	-275	-197	-111	261	-3	127

Table B2: F111 Wing Test - Intermediate Configuration
Complete CPLT Load and Strain Histories at FFVH#13, FFVH#14 and SRO#2

Load Case	Nominal %Load Level	Gauge ID							
		73-4	73-5	260-1	260-2	260-3	260-4	260-5	75-1
		Strain (microstrain)							
	0	64	-1502	601	348	119	493	-43	274
	10	461	-1020	869	251	-234	105	-273	695
	20	848	-486	1114	172	-546	-260	-494	1077
	30	1253	74	1369	79	-888	-654	-728	1488
	40	1663	664	1613	-28	-1242	-1059	-963	1912
	50	2077	1273	1847	-145	-1601	-1467	-1196	2343
-3.0g	60	2500	1885	2091	-264	-1968	-1887	-1437	2782
	70	2921	2506	2322	-388	-2331	-2298	-1671	3223
26deg.	80	3333	3118	2540	-515	-2685	-2700	-1897	3665
Wing	90	3753	3747	2764	-642	-3044	-3108	-2126	4126
Sweep	100	4175	4387	2987	-772	-3403	-3522	-2358	4597
	80	3344	3388	2424	-554	-2648	-2697	-1866	3716
	50	2151	1966	1643	-258	-1620	-1579	-1201	2436
	20	989	585	888	30	-620	-497	-562	1188
	10	604	128	638	124	-292	-139	-350	778
	20	1009	610	909	19	-659	-537	-583	1210
	0	229	-318	393	213	28	209	-144	381
	0	214	-351	364	147	-64	136	-163	410
	10	-737	-1463	-273	319	660	917	281	-540
	20	-1899	-2857	-1142	414	1472	1879	877	-1645
	30	-2988	-4183	-1977	480	2227	2793	1449	-2646
	40	-4098	-5557	-2821	555	3009	3738	2035	-3657
	50	-5198	-6954	-3654	621	3781	4681	2616	-4655
	60	-6291	-8379	-4475	685	4550	5627	3188	-5649
+7.33g	70	-7389	-9869	-5294	743	5323	6592	3767	-6641
	80	-8489	-11431	-6103	803	6101	7582	4347	-7630
26deg.	90	-9618	-13128	-6913	869	6899	8624	4940	-8623
Wing	100	-10817	-15085	-7743	999	7754	9786	5538	-9598
Sweep	80	-8684	-12546	-6081	866	6209	7990	4490	-7553
	50	-5366	-8537	-3437	746	3897	5177	2762	-4520
	20	-2035	-4371	-881	559	1592	2360	1012	-1516
	10	-919	-2904	-67	479	835	1434	440	-507
	20	-2006	-4193	-842	622	1631	2328	967	-1564
	0	125	-1512	634	363	132	599	-59	476

Table B2: F111 Wing Test - Intermediate Configuration
Complete CPLT Load and Strain Histories at FFVH#13, FFVH#14 and SRO#2

Load Case	Nominal %Load Level	Gauge ID							
		75-2	75-3	75-4	75-5	76-1	76-2	76-3	76-4
		Strain (microstrain)							
	0	153	4	100	131	172	151	88	12
	10	683	595	605	410	630	601	421	157
	20	1212	1208	1040	626	1065	1009	696	256
	30	1787	1876	1520	870	1519	1442	1002	384
	40	2400	2594	2010	1111	1987	1886	1312	518
	50	3041	3344	2504	1347	2466	2336	1618	649
-3.0g	60	3692	4106	3016	1594	2953	2797	1940	791
	70	4361	4885	3517	1826	3443	3255	2248	926
26deg.	80	5041	5665	4002	2044	3864	3705	2542	1054
Wing	90	5757	6478	4498	2265	4297	4167	2843	1186
Sweep	100	6503	7315	4993	2481	3897	4628	3134	1317
	80	5395	6071	3908	1870	2832	3686	2410	981
	50	3811	4331	2433	1076	1715	2353	1442	575
	20	2272	2644	1012	315	686	1061	525	206
	10	1765	2089	545	66	356	637	229	89
	20	2303	2687	1066	359	746	1095	575	244
	0	1275	1552	95	-175	36	225	-52	-17
	0	1308	1577	163	-125	43	275	56	71
	10	151	320	-906	-706	-810	-662	-603	-167
	20	-1200	-1156	-2150	-1395	-1734	-1743	-1343	-423
	30	-2441	-2527	-3289	-2021	-2678	-2737	-2038	-658
	40	-3723	-3959	-4445	-2658	-3630	-3727	-2722	-887
	50	-5023	-5423	-5577	-3273	-4569	-4703	-3381	-1100
	60	-6347	-6922	-6694	-27814	-5529	-5674	-4036	-1304
+7.33g	70	-7714	-8478	-7800	-414070	-6477	-6637	-4673	-1499
	80	-9122	-10093	-8910	-17143	-7410	-7595	-5293	-1682
26deg.	90	-10590	-11800	-10033	-473820	-8348	-8559	-5905	-1858
Wing	100	-12137	-13681	-11268	-428890	-9307	-9555	-6483	-2014
Sweep	80	-9659	-10989	-8936	-449160	-7301	-7573	-5076	-1567
	50	-5947	-6925	-5431	-2796	-4522	-4622	-3039	-929
	20	-2165	-2715	-1953	-896	-1916	-1682	-1055	-291
	10	-842	-1219	-807	-305	-1086	-691	-400	-78
	20	-2137	-2636	-2021	-971	-1984	-1732	-1137	-351
	0	466	252	253	207	-274	278	219	108

Table B2: F111 Wing Test - Intermediate Configuration
Complete CPLT Load and Strain Histories at FFVH#13, FFVH#14 and SRO#2

Load Case	Nominal %Load Level	Gauge ID							
		76-5	59\60-1	59\60-2	59\60-3	59\60-4	59\60-5	36\37-1	36\37-2
		Strain (microstrain)							
	0	-45	448	514	517	346	402	41	44
	10	-160	757	854	898	763	834	180	168
	20	-293	1089	1222	1325	1263	1356	320	289
	30	-405	1412	1581	1744	1756	1875	468	419
	40	-515	1736	1943	2174	2273	2420	618	550
	50	-626	2061	2307	2612	2811	2992	770	682
-3.0g	60	-736	2371	2655	3030	3322	3538	926	819
	70	-849	2678	3002	3453	3852	4110	1084	959
26deg.	80	-961	2979	3342	3873	4390	4698	1243	1098
Wing	90	-1073	3278	3684	4298	4942	5307	1405	1240
Sweep	100	-1182	3575	4022	4723	5507	5936	1567	1383
	80	-976	2995	3378	4001	4713	5107	1262	1110
	50	-621	2056	2338	2836	3433	3771	801	699
	20	-254	1107	1289	1663	2144	2429	340	289
	10	-130	783	932	1264	1707	1974	189	155
	20	-243	1091	1271	1643	2122	2407	338	288
	0	-7	454	569	860	1266	1517	42	24
	0	-15	364	474	755	1145	1392	46	29
	10	282	-264	-225	-31	281	486	-266	-248
	20	634	-1160	-1207	-1124	-916	-757	-581	-519
	30	981	-1999	-2125	-2146	-2038	-1921	-860	-757
	40	1322	-2913	-3119	-3253	-3258	-3185	-1110	-965
	50	1670	-3873	-4158	-4417	-4556	-4530	-1334	-1145
	60	2024	-4791	-5158	-5550	-5843	-5871	-1563	-1329
+7.33g	70	2382	-5696	-6148	-6690	-7168	-7260	-1791	-1509
	80	2742	-6578	-7116	-7823	-8518	-8685	-2019	-1687
26deg.	90	3108	-7441	-8073	-8968	-9909	-10153	-2254	-1869
Wing	100	3480	-8273	-9019	-10135	-11338	-11647	-2496	-2056
Sweep	80	2758	-6532	-7111	-8017	-9029	-9239	-2032	-1683
	50	1691	-3775	-4107	-4686	-5397	-5467	-1349	-1132
	20	657	-1130	-1222	-1459	-1830	-1764	-589	-499
	10	313	-318	-324	-433	-663	-545	-287	-240
	20	636	-1085	-1172	-1379	-1699	-1626	-600	-514
	0	-42	461	541	570	497	670	37	39

Table B2: F111 Wing Test - Intermediate Configuration
Complete CPLT Load and Strain Histories at FFVH#13, FFVH#14 and SRO#2

Load Case	Nominal %Load Level	Gauge ID		
		36\37-3	36\37-4	36\37-5
		Strain (microstrain)		
	0	45	54	67
	10	156	156	166
	20	263	252	255
	30	376	355	350
	40	491	457	444
	50	606	559	537
-3.0g	60	727	667	636
	70	849	775	734
26deg.	80	971	883	832
Wing	90	1095	993	932
Sweep	100	1220	1103	1030
	80	972	873	811
	50	603	530	485
	20	234	190	160
	10	114	79	54
	20	234	190	161
	0	-3	-30	-50
	0	3	-21	-39
	10	-244	-248	-254
	20	-481	-461	-453
	30	-686	-645	-624
	40	-861	-795	-760
	50	-1004	-914	-863
	60	-1151	-1032	-963
+7.33g	70	-1290	-1141	-1049
	80	-1425	-1241	-1125
26deg.	90	-1560	-1336	-1191
Wing	100	-1696	-1428	-1246
Sweep	80	-1397	-1182	-1035
	50	-953	-815	-715
	20	-422	-355	-299
	10	-199	-158	-120
	20	-441	-379	-327
	0	41	54	73

Table B3: F111 Wing Test - Large Configuration
Complete CPLT Load and Strain Histories at FFVH#13, FFVH#14 and SRO#2

Load Case	Nominal %Load Level	Actuator ID						Gauge ID	
		Act. E	Act. F	Act. G	Act. H	Act. I	Act. J	72-1	72-2
		Load (kN)						Strain (microstrain)	
	0	0.0	0.0	0.0	0.1	0.0	0.0	-56	-46
	10	14.0	0.0	0.0	10.6	0.0	0.0	-124	-91
	20	27.8	0.0	0.0	21.0	0.0	0.0	-184	-129
	30	41.7	0.0	0.0	31.4	0.0	0.0	-252	-174
	40	55.5	0.0	0.0	41.7	0.0	0.0	-323	-223
	50	69.5	0.0	0.0	52.1	0.0	0.0	-391	-269
-2.4g	60	83.4	0.0	0.0	62.4	0.0	0.0	-457	-312
	70	97.3	0.0	0.0	72.8	0.0	0.0	-522	-355
56deg.	80	111.1	0.0	0.0	83.1	0.0	0.0	-587	-397
Wing	90	125.0	0.0	0.0	93.4	0.0	0.0	-652	-440
Sweep	100	138.8	0.0	0.0	103.6	0.0	0.0	-715	-481
	80	111.1	0.0	0.0	83.2	0.0	0.0	-560	-373
	50	69.4	0.0	0.0	52.1	0.0	0.0	-388	-267
	20	27.9	0.0	0.0	21.0	0.0	0.0	-219	-164
	10	13.9	0.0	0.0	10.5	0.0	0.0	-162	-127
	20	27.8	0.0	0.0	21.0	0.0	0.0	-234	-177
	0	0.0	0.0	0.0	0.0	0.0	0.0	-102	-89
	0	0.0	-0.1	-0.1	0.0	0.0	0.0	-102	-90
	10	-10.6	-13.2	-12.7	-13.3	-2.0	-3.2	17	-49
	20	-21.0	-26.3	-25.2	-26.4	-4.1	-6.4	208	56
	30	-31.3	-39.4	-37.7	-39.7	-6.1	-9.6	414	176
	40	-41.7	-52.5	-50.2	-52.9	-8.1	-12.7	601	279
	50	-52.1	-65.6	-62.7	-66.1	-10.1	-15.9	783	378
+7.33g	60	-62.5	-78.7	-75.3	-79.4	-12.2	-19.1	955	470
	70	-72.8	-91.8	-87.8	-92.5	-14.2	-22.3	1131	565
56deg.	80	-83.2	-104.9	-100.3	-105.7	-16.2	-25.5	1311	666
Wing	90	-93.6	-117.9	-112.8	-118.9	-18.2	-28.7	1491	772
Sweep	100	-104.0	-130.9	-125.3	-132.0	-20.3	-31.9	1678	891
	80	-83.3	-104.8	-100.3	-104.5	-16.2	-25.5	1417	780
	50	-52.1	-65.4	-62.7	-66.0	-10.1	-16.0	891	508
	20	-20.9	-26.0	-25.2	-26.5	-4.1	-6.4	296	172
	10	-10.6	-13.0	-12.7	-13.3	-2.0	-3.2	96	61
	20	-21.0	-26.3	-25.2	-26.4	-4.1	-6.4	224	109
	0	-0.3	-0.1	-0.4	-0.1	0.0	-0.1	-64	-19

Table B3: F111 Wing Test - Large Configuration
Complete CPLT Load and Strain Histories at FFVH#13, FFVH#14 and SRO#2

Load Case	Nominal %Load Level	Gauge ID							
		72-3	72-4	72-5	258-1	258-2	258-3	258-4	258-5
		Strain (microstrain)							
	0	-36	-29	-21	148	138	127	110	91
	10	-62	-36	-10	453	424	390	340	283
	20	-81	-37	7	755	704	646	561	464
	30	-107	-44	18	1070	995	909	787	645
	40	-136	-55	27	1394	1294	1180	1017	828
	50	-162	-62	37	1711	1586	1443	1240	1004
-2.4g	60	-186	-68	50	2028	1876	1705	1462	1178
	70	-209	-72	64	2344	2165	1964	1682	1349
56deg.	80	-232	-77	78	2656	2450	2219	1897	1517
Wing	90	-255	-81	93	2973	2739	2477	2115	1685
Sweep	100	-277	-85	107	3287	3026	2733	2330	1852
	80	-210	-57	97	2639	2417	2173	1838	1441
	50	-162	-64	36	1734	1583	1420	1195	926
	20	-115	-70	-24	841	766	687	573	435
	10	-98	-71	-43	541	492	440	363	268
	20	-127	-80	-33	856	788	714	605	471
	0	-78	-69	-59	249	223	198	157	104
	0	-79	-69	-59	239	218	198	161	112
	10	-105	-157	-211	-921	-863	-795	-710	-628
	20	-73	-195	-316	-2179	-2059	-1922	-1727	-1527
	30	-29	-221	-412	-3475	-3297	-3088	-2779	-2453
	40	1	-260	-519	-4724	-4488	-4219	-3799	-3342
	50	27	-302	-628	-5943	-5648	-5321	-4793	-4213
+7.33g	60	45	-350	-742	-7174	-6800	-6396	-5751	-5058
	70	69	-393	-851	-8627	-8035	-7416	-6611	-5814
56deg.	80	100	-428	-952	-10542	-9552	-8443	-7309	-6353
Wing	90	139	-452	-1040	-12942	-11434	-9664	-7983	-6731
Sweep	100	195	-459	-1112	-15943	-13849	-11260	-8831	-7089
	80	211	-326	-861	-13675	-11681	-9193	-6946	-5390
	50	156	-179	-514	-9719	-7928	-5675	-3792	-2581
	20	47	-79	-207	-5515	-4002	-2117	-702	110
	10	11	-44	-102	-3971	-2605	-917	285	931
	20	-11	-129	-250	-5185	-3753	-1989	-670	97
	0	0	11	18	-2519	-1321	149	1131	1606

Table B3: F111 Wing Test - Large Configuration
Complete CPLT Load and Strain Histories at FFVH#13, FFVH#14 and SRO#2

Load Case	Nominal %Load Level	Gauge ID							
		259-1	259-2	259-3	259-4	259-5	300-1	300-2	300-3
		Strain (microstrain)							
	0	-12	-14	-45	-111	-72	115	135	152
	10	-37	-41	-150	-301	-177	419	447	473
	20	-76	-67	-251	-479	-272	730	764	797
	30	-125	-95	-352	-668	-376	1041	1092	1140
	40	-180	-123	-455	-864	-485	1347	1419	1489
	50	-242	-149	-556	-1055	-589	1658	1751	1841
-2.4g	60	-304	-175	-657	-1245	-692	1973	2086	2195
	70	-369	-199	-758	-1432	-794	2289	2426	2555
56deg.	80	-435	-222	-858	-1618	-895	2604	2764	2911
Wing	90	-503	-242	-959	-1804	-996	2925	3108	3275
Sweep	100	-571	-263	-1059	-1989	-1096	3234	3450	3636
	80	-525	-221	-836	-1577	-863	2605	2799	2963
	50	-362	-152	-544	-1050	-584	1646	1821	1969
	20	-178	-74	-257	-528	-309	684	838	973
	10	-119	-46	-161	-353	-215	361	508	638
	20	-141	-72	-271	-551	-326	672	828	968
	0	-67	-18	-65	-177	-121	50	189	314
	0	-51	-25	-69	-173	-121	43	175	297
	10	-16	61	245	331	120	-1145	-1049	-956
	20	-107	159	608	948	445	-2299	-2265	-2231
	30	-217	260	996	1587	785	-3474	-3499	-3531
	40	-334	366	1377	2197	1106	-4651	-4725	-4813
	50	-460	479	1746	2797	1422	-5799	-5924	-6069
+7.33g	60	-575	605	2094	3379	1725	-6934	-7129	-7346
	70	-650	737	2411	3960	2031	-8123	-8467	-8823
56deg.	80	-586	893	2754	4531	2334	-9492	-10123	-10775
Wing	90	-370	1062	3234	5064	2628	-10954	-12001	-13120
Sweep	100	-35	1244	3803	5531	2911	-12500	-14076	-15773
	80	170	810	3136	4532	2415	-10248	-11777	-13413
	50	566	367	2010	2778	1500	-6516	-7911	-9391
	20	897	94	867	923	508	-2791	-3944	-5177
	10	944	27	485	305	176	-1500	-2516	-3623
	20	891	107	805	821	430	-2681	-3736	-4881
	0	895	-35	151	-241	-105	-270	-1141	-2119

Table B3: F111 Wing Test - Large Configuration
Complete CPLT Load and Strain Histories at FFVH#13, FFVH#14 and SRO#2

Load Case	Nominal %Load Level	Gauge ID							
		300-4	300-5	301-1	301-2	301-3	301-4	301-5	302-1
		Strain (microstrain)							
	0	158	155	8	24	44	65	90	-100
	10	479	473	185	230	286	333	378	-50
	20	803	789	371	445	536	609	675	4
	30	1148	1124	536	641	771	873	964	9
	40	1501	1466	696	832	1000	1130	1246	8
	50	1853	1806	866	1034	1239	1397	1537	19
-2.4g	60	2208	2147	1042	1242	1485	1671	1832	35
	70	2565	2489	1224	1456	1738	1950	2127	57
56deg.	80	2920	2828	1407	1671	1990	2228	2423	80
Wing	90	3280	3172	1594	1890	2248	2513	2727	106
Sweep	100	3639	3514	1780	2107	2503	2794	3024	132
	80	2959	2841	1428	1694	2014	2248	2434	65
	50	1974	1884	855	1026	1229	1383	1510	-66
	20	991	934	291	365	449	518	584	-170
	10	660	614	105	145	190	230	275	-199
	20	991	941	281	352	434	502	568	-154
	0	340	303	-73	-65	-59	-46	-22	-224
	0	322	289	-81	-74	-67	-56	-31	-206
	10	-926	-933	-747	-859	-999	-1094	-1151	-342
	20	-2224	-2231	-1325	-1555	-1841	-2052	-2207	-360
	30	-3552	-3563	-1923	-2273	-2706	-3029	-3283	-393
	40	-4849	-4856	-2547	-3018	-3594	-4024	-4371	-473
	50	-6120	-6120	-3167	-3751	-4462	-4994	-5429	-553
+7.33g	60	-7421	-7414	-3776	-4468	-5309	-5941	-6461	-639
	70	-8990	-9002	-4328	-5110	-6055	-6789	-7464	-697
56deg.	80	-11104	-11181	-4730	-5560	-6575	-7553	-8565	-675
Wing	90	-13703	-13914	-4981	-5841	-7004	-8361	-9722	-561
Sweep	100	-16708	-17189	-5131	-6039	-7445	-9185	-10904	-353
	80	-14341	-14837	-3863	-4555	-5692	-7229	-8784	13
	50	-10265	-10756	-1967	-2284	-2947	-4103	-5342	294
	20	-5932	-6391	-192	-167	-381	-1123	-1991	436
	10	-4317	-4762	381	512	442	-142	-860	449
	20	-5585	-6022	-289	-267	-479	-1167	-1967	238
	0	-2759	-3202	929	1152	1213	784	216	477

Table B3: F111 Wing Test - Large Configuration
Complete CPLT Load and Strain Histories at FFVH#13, FFVH#14 and SRO#2

Load Case	Nominal %Load Level	Gauge ID							
		302-2	302-3	302-4	302-5	303-1	303-2	303-3	303-4
		Strain (microstrain)							
	0	-97	-71	-36	-10	57	66	83	96
	10	3	74	126	154	253	286	342	374
	20	109	227	297	325	450	508	603	654
	30	161	333	432	472	642	724	859	932
	40	207	430	560	611	833	940	1118	1216
	50	266	541	700	762	1027	1160	1382	1507
-2.4g	60	332	660	848	919	1221	1380	1649	1799
	70	404	786	1002	1082	1416	1601	1918	2095
56deg.	80	478	913	1157	1246	1608	1820	2184	2387
Wing	90	556	1046	1317	1414	1803	2041	2455	2685
Sweep	100	634	1177	1476	1580	1995	2261	2724	2980
	80	463	908	1164	1259	1602	1818	2201	2416
	50	173	463	653	736	1004	1146	1414	1574
	20	-85	50	165	228	410	479	632	736
	10	-166	-83	6	61	212	257	372	458
	20	-69	59	166	223	411	482	636	742
	0	-239	-206	-144	-98	20	42	119	188
	0	-226	-201	-146	-102	20	40	117	185
	10	-535	-687	-717	-699	-686	-746	-796	-784
	20	-710	-1041	-1176	-1202	-1395	-1540	-1724	-1775
	30	-906	-1419	-1658	-1725	-2104	-2335	-2653	-2769
	40	-1156	-1845	-2176	-2276	-2811	-3124	-3569	-3748
	50	-1407	-2273	-2691	-2825	-3508	-3900	-4468	-4708
+7.33g	60	-1666	-2704	-3205	-3368	-4191	-4660	-5350	-5652
	70	-1888	-3090	-3672	-3863	-4867	-5415	-6231	-6599
56deg.	80	-2008	-3355	-4014	-4231	-5536	-6165	-7116	-7559
Wing	90	-2006	-3478	-4216	-4461	-6187	-6898	-7994	-8523
Sweep	100	-1885	-3470	-4297	-4583	-6774	-7571	-8846	-9546
	80	-1156	-2424	-3134	-3414	-5394	-6028	-7050	-7634
	50	-348	-1091	-1537	-1729	-3222	-3597	-4210	-4596
	20	291	80	-79	-164	-1083	-1197	-1398	-1580
	10	466	437	385	341	-373	-400	-461	-567
	20	72	-120	-231	-277	-1087	-1198	-1390	-1557
	0	645	790	837	829	306	365	441	406

Table B3: F111 Wing Test - Large Configuration
Complete CPLT Load and Strain Histories at FFVH#13, FFVH#14 and SRO#2

Load Case	Nominal %Load Level	Gauge ID							
		303-5	73-1	73-2	73-3	73-4	73-5	260-1	260-2
		Strain (microstrain)							
	0	102	114	139	202	125	128	45	-40
	10	392	422	472	569	447	369	-45	-355
	20	684	729	803	933	762	601	-133	-659
	30	972	1033	1141	1333	1066	837	-193	-926
	40	1265	1346	1497	1780	1370	1069	-260	-1204
	50	1564	1661	1862	2245	1672	1296	-340	-1496
-2.4g	60	1865	1981	2230	2722	1971	1517	-424	-1793
	70	2168	2301	2605	3209	2270	1735	-514	-2094
56deg.	80	2468	2620	2978	3703	2564	1949	-604	-2394
Wing	90	2772	2943	3358	4213	2860	2162	-696	-2698
Sweep	100	3074	3264	3738	4728	3152	2371	-789	-2999
	80	2482	2629	3047	3960	2469	1850	-621	-2355
	50	1607	1712	2062	2876	1538	1158	-376	-1482
	20	738	803	1084	1803	616	467	-150	-635
	10	448	499	759	1445	308	233	-77	-354
	20	745	815	1100	1822	639	483	-166	-674
	0	166	204	440	1094	6	4	-9	-79
	0	164	202	438	1089	5	3	-15	-80
	10	-834	-821	-648	-91	-1014	-807	102	681
	20	-1861	-1888	-1799	-1366	-2127	-1739	150	1450
	30	-2891	-2965	-2968	-2677	-3254	-2696	177	2219
	40	-3907	-4018	-4128	-3989	-4340	-3622	231	3018
	50	-4905	-5057	-5266	-5312	-5399	-4531	281	3817
+7.33g	60	-5889	-6089	-6390	-6664	-6437	-5420	334	4621
	70	-6883	-7132	-7537	-8089	-7503	-6313	374	5429
56deg.	80	-7895	-8198	-8718	-9555	-8894	-7223	411	6252
Wing	90	-8917	-9264	-9895	-11104	-11000	-8242	512	7124
Sweep	100	-10071	-10463	-11223	-13123	-13896	-9745	925	8168
	80	-8089	-8401	-9012	-10710	-11775	-7991	721	6504
	50	-4933	-5092	-5455	-6766	-8231	-5041	580	4063
	20	-1796	-1804	-1880	-2677	-4558	-2117	433	1689
	10	-740	-700	-663	-1221	-3258	-1150	377	915
	20	-1763	-1753	-1786	-2445	-4334	-1992	537	1757
	0	271	343	486	173	-2033	-294	285	187

Table B3: F111 Wing Test - Large Configuration
Complete CPLT Load and Strain Histories at FFVH#13, FFVH#14 and SRO#2

Load Case	Nominal %Load Level	Gauge ID							
		260-3	260-4	260-5	75-1	75-2	75-3	75-4	75-5
		Strain (microstrain)							
	0	-88	-72	-63	62	115	170	102	41
	10	-436	-275	-215	383	522	636	524	291
	20	-773	-471	-363	697	920	1091	931	531
	30	-1084	-660	-509	987	1315	1560	1303	732
	40	-1406	-855	-661	1286	1750	2091	1689	933
	50	-1740	-1055	-814	1597	2213	2655	2089	1139
-2.4g	60	-2075	-1255	-968	1912	2689	3236	2495	1343
	70	-2413	-1458	-1122	2230	3176	3831	2904	1547
56deg.	80	-2750	-1659	-1276	2546	3665	4432	3311	1746
Wing	90	-3089	-1862	-1431	2866	4170	5049	3726	1944
Sweep	100	-3426	-2064	-1586	3186	4677	5671	4137	2140
	80	-2698	-1633	-1258	2540	3847	4708	3253	1604
	50	-1726	-1059	-823	1606	2667	3374	2076	928
	20	-774	-495	-392	688	1513	2073	931	272
	10	-455	-305	-247	387	1133	1645	554	55
	20	-812	-514	-405	709	1544	2116	983	313
	0	-142	-118	-103	94	763	1226	186	-157
	0	-134	-110	-93	102	781	1237	213	-141
	10	774	442	332	-812	-351	-22	-889	-771
	20	1739	1040	801	-1752	-1523	-1342	-2059	-1461
	30	2723	1655	1283	-2675	-2686	-2665	-3217	-2135
	40	3727	2272	1765	-3597	-3859	-4011	-4383	-2818
	50	4743	2891	2250	-4513	-5042	-5388	-5540	-3487
+7.33g	60	5771	3508	2732	-5423	-6245	-6803	-6688	-4140
	70	7209	4131	3221	-6331	-7483	-8284	-7846	-4786
56deg.	80	8542	4761	3717	-7237	-8762	-9845	-9026	-5427
Wing	90	10149	5362	4205	-8128	-10079	-11494	-10245	-6050
Sweep	100	11825	5910	4656	-8951	-11373	-13285	-11808	-6681
	80	9734	4706	3738	-7091	-9069	-10705	-9487	-5268
	50	6469	2810	2256	-4270	-5543	-6720	-5909	-3136
	20	3229	950	790	-1508	-1996	-2610	-2339	-1093
	10	2152	346	311	-589	-769	-1145	-1139	-450
	20	3174	930	755	-1557	-1979	-2511	-2359	-1165
	0	1155	-195	-115	302	434	290	-16	116

Table B3: F111 Wing Test - Large Configuration
Complete CPLT Load and Strain Histories at FFVH#13, FFVH#14 and SRO#2

Load Case	Nominal %Load Level	Gauge ID							
		76-1	76-2	76-3	76-4	76-5	59\60-1	59\60-2	59\60-3
		Strain (microstrain)							
	0	18	96	61	32	-46	145	174	194
	10	288	455	340	165	-123	421	477	520
	20	536	804	605	286	-204	695	780	846
	30	760	1128	839	383	-292	983	1110	1213
	40	984	1461	1077	490	-371	1275	1460	1612
	50	1212	1805	1323	604	-448	1575	1823	2028
-2.4g	60	1442	2155	1572	720	-526	1877	2193	2456
	70	1664	2507	1821	835	-603	2178	2565	2890
56deg.	80	1857	2857	2066	950	-679	2470	2929	3318
Wing	90	2017	3214	2314	1067	-756	2764	3298	3753
Sweep	100	1911	3567	2558	1182	-832	3052	3664	4188
	80	1420	2840	1977	889	-701	2551	3108	3586
	50	836	1815	1209	549	-448	1719	2188	2589
	20	283	816	471	231	-189	869	1249	1572
	10	102	487	231	131	-101	581	931	1229
	20	328	849	514	267	-177	857	1236	1558
	0	-76	166	-2	33	-14	289	610	883
	0	-174	188	47	95	3	273	592	864
	10	-741	-741	-591	-125	304	-547	-317	-123
	20	-1320	-1708	-1277	-385	597	-1448	-1312	-1199
	30	-1950	-2667	-1948	-629	910	-2422	-2383	-2356
	40	-2674	-3616	-2615	-871	1214	-3398	-3459	-3520
	50	-3410	-4560	-3272	-1103	1527	-4388	-4552	-4705
+7.33g	60	-4116	-5498	-3917	-1325	1846	-5361	-5645	-5902
	70	-4736	-6436	-4556	-1539	2170	-6322	-6747	-7129
56deg.	80	-5349	-7376	-5188	-1746	2499	-7275	-7865	-8394
Wing	90	-5975	-8316	-5808	-1946	2830	-8221	-9006	-9701
Sweep	100	-6639	-9299	-6408	-2133	3166	-9181	-10200	-11074
	80	-5121	-7411	-5035	-1642	2541	-7313	-8143	-8849
	50	-3241	-4538	-3025	-955	1566	-4268	-4796	-5235
	20	-1485	-1688	-1066	-269	630	-1355	-1551	-1702
	10	-913	-727	-418	-41	320	-440	-502	-538
	20	-1534	-1731	-1141	-332	602	-1299	-1452	-1568
	0	-349	209	196	158	1	438	518	605

Table B3: F111 Wing Test - Large Configuration
Complete CPLT Load and Strain Histories at FFVH#13, FFVH#14 and SRO#2

Load Case	Nominal %Load Level	Gauge ID							
		59\60-4	59\60-5	359\360-1	359\360-2	359\360-3	359\360-4	350\360-5	36\37-1
		Strain (microstrain)							
	0	203	191	219	179	128	91	69	20
	10	544	542	574	508	410	333	265	131
	20	883	893	929	838	692	576	460	242
	30	1263	1287	1330	1199	984	815	652	352
	40	1673	1722	1772	1590	1286	1050	839	464
	50	2102	2178	2234	1998	1599	1290	1032	578
-2.4g	60	2542	2647	2709	2420	1919	1533	1227	691
	70	2989	3120	3191	2848	2242	1774	1420	807
56deg.	80	3431	3584	3666	3270	2558	2007	1607	922
Wing	90	3881	4054	4149	3698	2878	2241	1793	1040
Sweep	100	4331	4520	4629	4123	3193	2469	1975	1158
	80	3701	3864	3962	3497	2652	1998	1592	936
	50	2658	2784	2865	2472	1772	1238	976	591
	20	1598	1690	1758	1442	891	481	365	248
	10	1242	1323	1388	1099	598	231	164	135
	20	1585	1677	1747	1433	884	477	363	247
	0	882	953	1017	756	308	-17	-34	25
	0	863	935	1000	739	296	-26	-42	21
	10	-173	-145	-103	-299	-604	-810	-683	-285
	20	-1297	-1311	-1290	-1411	-1561	-1637	-1359	-568
	30	-2502	-2557	-2560	-2595	-2571	-2508	-2072	-814
	40	-3727	-3817	-3859	-3798	-3588	-3382	-2793	-1049
	50	-4988	-5097	-5213	-5035	-4626	-4270	-3527	-1267
+7.33g	60	-6265	-6386	-6597	-6284	-5660	-5143	-4248	-1480
	70	-7579	-7705	-8031	-7560	-6700	-6003	-4954	-1693
56deg.	80	-8936	-9063	-9526	-8880	-7751	-6848	-5642	-1909
Wing	90	-10338	-10472	-11106	-10261	-8821	-7678	-6303	-2126
Sweep	100	-11808	-12009	-12879	-11791	-9978	-8627	-6905	-2349
	80	-9476	-9588	-10410	-9460	-7946	-6855	-5448	-1919
	50	-5704	-5683	-6424	-5717	-4708	-4042	-3151	-1267
	20	-2014	-1859	-2476	-2061	-1615	-1394	-998	-542
	10	-793	-587	-1138	-846	-619	-561	-327	-255
	20	-1873	-1709	-2284	-1925	-1555	-1378	-994	-552
	0	409	666	191	352	350	235	311	45

Table B3: F111 Wing Test - Large Configuration
Complete CPLT Load and Strain Histories at FFVH#13, FFVH#14 and SRO#2

Load Case	Nominal %Load Level	Gauge ID			
		36\37-2	36\37-3	36\37-4	36\37-5
		Strain (microstrain)			
	0	16	12	10	10
	10	114	100	92	89
	20	213	189	175	168
	30	310	276	254	243
	40	409	364	333	317
	50	508	451	412	389
-2.4g	60	608	538	490	460
	70	709	626	568	533
56deg.	80	810	715	647	604
Wing	90	913	806	728	679
Sweep	100	1017	897	809	752
	80	818	717	641	592
	50	511	440	385	347
	20	206	165	130	104
	10	105	75	46	24
	20	206	165	131	104
	0	8	-13	-35	-55
	0	6	-14	-36	-56
	10	-263	-252	-254	-260
	20	-508	-467	-448	-443
	30	-716	-644	-604	-588
	40	-911	-808	-748	-719
	50	-1089	-953	-871	-828
+7.33g	60	-1260	-1090	-983	-924
	70	-1429	-1222	-1087	-1010
56deg.	80	-1598	-1351	-1185	-1086
Wing	90	-1766	-1476	-1276	-1151
Sweep	100	-1938	-1601	-1361	-1205
	80	-1590	-1323	-1132	-1008
	50	-1065	-899	-780	-700
	20	-460	-390	-337	-299
	10	-214	-178	-150	-127
	20	-473	-407	-358	-323
	0	45	45	47	52

Table B3: F111 Wing Test - Large Configuration
Complete CPLT Load and Strain Histories at FFVH#13, FFVH#14 and SRO#2

Load Case	Nominal %Load Level	Actuator ID						Gauge ID	
		Act. E	Act. F	Act. G	Act. H	Act. I	Act. J	72-1	72-2
		Load (kN)						Strain (microstrain)	
	0	-0.1	-0.2	-0.1	0.1	0.0	0.0	-83	-24
	10	12.5	7.1	-0.1	10.5	0.0	0.0	-162	-77
	20	25.2	14.3	-0.1	20.9	0.0	0.0	-246	-134
	30	37.9	21.6	-0.1	31.1	0.0	0.0	-335	-194
	40	50.5	28.8	-0.1	41.5	0.0	0.0	-418	-250
	50	63.2	36.0	-0.1	52.0	0.0	0.0	-496	-301
-3.0g	60	75.9	43.3	-0.1	62.4	0.0	0.0	-573	-351
	70	88.6	50.5	-0.1	72.9	0.0	0.0	-647	-398
26deg.	80	101.2	57.6	-0.1	83.1	0.0	0.0	-724	-448
Wing	90	113.8	64.8	-0.1	93.4	0.0	0.0	-799	-496
Sweep	100	126.4	71.9	-0.1	103.6	0.0	0.0	-874	-545
	80	101.2	57.8	-0.1	83.5	0.0	0.0	-688	-417
	50	63.1	36.0	-0.1	52.0	0.0	0.0	-477	-290
	20	25.2	14.3	-0.1	20.8	0.0	0.0	-276	-170
	10	12.5	7.1	-0.1	10.3	0.0	0.0	-208	-129
	20	25.1	14.3	-0.1	20.8	0.0	0.0	-292	-184
	0	-0.2	-0.2	-0.1	-0.1	0.0	0.0	-139	-86
	0	-0.1	0.0	0.0	0.1	0.0	-0.1	-146	-89
	10	-10.6	-13.1	-12.6	-13.1	-2.0	-3.3	-13	-35
	20	-21.0	-26.2	-25.1	-26.3	-4.0	-6.5	183	75
	30	-31.3	-39.3	-37.6	-39.5	-6.0	-9.6	387	191
	40	-41.7	-52.5	-50.2	-52.7	-8.1	-12.8	585	303
	50	-52.1	-65.6	-62.7	-65.9	-10.1	-16.0	765	400
+7.33g	60	-62.4	-78.7	-75.3	-79.2	-12.1	-19.2	948	500
	70	-72.8	-91.9	-87.8	-92.3	-14.1	-22.4	1122	593
26deg.	80	-83.1	-104.9	-100.3	-105.5	-16.2	-25.5	1296	687
Wing	90	-93.5	-118.0	-112.8	-118.7	-18.2	-28.7	1477	788
Sweep	100	-103.8	-131.0	-125.3	-131.8	-20.2	-31.9	1662	898
	80	-83.1	-105.0	-100.3	-105.5	-16.2	-25.5	1407	796
	50	-52.0	-65.6	-62.7	-65.8	-10.1	-16.0	875	517
	20	-20.9	-26.2	-25.1	-26.1	-4.0	-6.5	272	178
	10	-10.5	-13.1	-12.6	-12.9	-2.0	-3.3	73	68
	20	-21.0	-26.2	-25.1	-26.1	-4.0	-6.5	201	114
	0	-0.4	-0.1	-0.3	-0.2	0.0	-0.1	-90	-15

Table B3: F111 Wing Test - Large Configuration
Complete CPLT Load and Strain Histories at FFVH#13, FFVH#14 and SRO#2

Load Case	Nominal %Load Level	Gauge ID							
		72-3	72-4	72-5	258-1	258-2	258-3	258-4	258-5
					Strain (microstrain)				
	0	-4	8	17	-2461	-1291	143	1100	1559
	10	-33	1	32	-2067	-933	457	1363	1770
	20	-66	-9	43	-1611	-536	785	1622	1967
	30	-103	-22	54	-1108	-110	1119	1872	2148
	40	-134	-30	69	-590	317	1441	2103	2306
	50	-161	-35	88	-84	735	1759	2335	2465
-3.0g	60	-187	-37	109	434	1156	2072	2556	2614
	70	-211	-38	131	972	1583	2376	2762	2742
26deg.	80	-237	-41	151	1474	1992	2684	2985	2894
Wing	90	-262	-43	172	2007	2417	2993	3200	3034
Sweep	100	-287	-46	192	2545	2844	3302	3413	3171
	80	-209	-16	175	1752	2098	2616	2814	2675
	50	-155	-32	89	583	1030	1664	2012	2046
	20	-107	-50	4	-556	-4	748	1248	1455
	10	-89	-55	-24	-937	-350	442	991	1256
	20	-119	-61	-6	-544	18	779	1285	1499
	0	-69	-57	-48	-1307	-686	143	740	1060
	0	-71	-58	-47	-1328	-694	151	760	1086
	10	-85	-135	-188	-2515	-1797	-859	-122	335
	20	-51	-172	-295	-3828	-3037	-2012	-1152	-571
	30	-11	-203	-396	-5175	-4308	-3189	-2196	-1486
	40	25	-238	-501	-6548	-5585	-4354	-3222	-2385
	50	49	-282	-613	-7909	-6843	-5490	-4216	-3258
+7.33g	60	76	-323	-721	-9331	-8137	-6632	-5196	-4113
	70	97	-369	-833	-10825	-9471	-7775	-6149	-4929
26deg.	80	121	-410	-941	-12409	-10858	-8922	-7072	-5698
Wing	90	153	-445	-1042	-14146	-12350	-10105	-7972	-6415
Sweep	100	195	-467	-1129	-16279	-14147	-11444	-8878	-7026
	80	223	-320	-862	-13932	-11912	-9327	-6963	-5313
	50	162	-177	-518	-9960	-8142	-5793	-3794	-2493
	20	53	-72	-201	-5686	-4143	-2155	-629	263
	10	20	-34	-92	-4127	-2726	-930	382	1105
	20	-5	-122	-245	-5363	-3895	-2021	-588	259
	0	6	18	26	-2684	-1442	146	1242	1793

Table B3: F111 Wing Test - Large Configuration
Complete CPLT Load and Strain Histories at FFVH#13, FFVH#14 and SRO#2

Load Case	Nominal %Load Level	Gauge ID							
		259-1	259-2	259-3	259-4	259-5	300-1	300-2	300-3
					Strain (microstrain)				
	0	862	-31	171	-249	-112	-279	-1130	-2074
	10	808	-62	50	-470	-233	105	-721	-1647
	20	730	-93	-79	-702	-363	516	-260	-1146
	30	632	-125	-214	-941	-497	944	233	-599
	40	510	-155	-346	-1171	-624	1391	748	-26
	50	396	-182	-477	-1396	-747	1845	1263	544
-3.0g	60	273	-208	-609	-1617	-867	2310	1796	1135
	70	130	-233	-740	-1832	-985	2795	2355	1759
26deg.	80	12	-257	-871	-2049	-1103	3258	2882	2339
Wing	90	-118	-280	-1004	-2266	-1222	3740	3437	2959
Sweep	100	-250	-303	-1137	-2482	-1341	4223	3998	3587
	80	-177	-257	-871	-1981	-1060	3438	3186	2752
	50	62	-179	-511	-1320	-711	2187	1909	1457
	20	324	-94	-167	-684	-377	947	642	174
	10	406	-65	-53	-471	-265	535	220	-253
	20	367	-94	-183	-708	-396	929	626	162
	0	481	-36	60	-260	-153	137	-187	-667
	0	507	-31	52	-275	-160	126	-211	-702
	10	531	41	360	246	97	-1080	-1459	-1983
	20	456	125	713	873	430	-2280	-2733	-3319
	30	371	213	1086	1508	769	-3491	-4016	-4673
	40	283	310	1459	2135	1103	-4764	-5366	-6095
	50	189	422	1831	2727	1415	-6009	-6698	-7507
+7.33g	60	98	548	2210	3320	1730	-7264	-8066	-8981
	70	37	698	2592	3894	2032	-8542	-9484	-10532
26deg.	80	2	869	2981	4460	2332	-9839	-10956	-12173
Wing	90	5	1061	3390	5025	2636	-11179	-12521	-13957
Sweep	100	118	1270	3829	5557	2933	-12638	-14302	-16057
	80	292	817	3159	4550	2437	-10319	-11929	-13618
	50	676	370	2039	2783	1512	-6564	-8039	-9574
	20	1019	101	897	901	505	-2761	-3994	-5287
	10	1066	34	518	277	172	-1442	-2539	-3711
	20	1016	114	837	799	426	-2646	-3785	-4996
	0	1028	-23	188	-269	-113	-211	-1169	-2218

Table B3: F111 Wing Test - Large Configuration
Complete CPLT Load and Strain Histories at FFVH#13, FFVH#14 and SRO#2

Load Case	Nominal %Load Level	Gauge ID							
		300-4	300-5	301-1	301-2	301-3	301-4	301-5	302-1
						Strain (microstrain)			
	0	-2702	-3136	907	1121	1175	750	201	442
	10	-2274	-2717	1096	1345	1445	1064	552	450
	20	-1762	-2218	1272	1554	1700	1371	912	436
	30	-1195	-1659	1444	1756	1948	1679	1279	417
	40	-603	-1077	1626	1968	2206	2002	1665	410
	50	-18	-505	1820	2191	2476	2336	2062	420
-3.0g	60	588	87	2015	2415	2747	2675	2467	436
	70	1227	708	2210	2637	3019	3020	2887	450
26deg.	80	1818	1283	2408	2863	3292	3363	3295	472
Wing	90	2451	1899	2602	3084	3562	3707	3713	489
Sweep	100	3093	2524	2791	3299	3827	4049	4131	502
	80	2253	1695	2347	2779	3210	3362	3388	414
	50	972	453	1610	1919	2199	2239	2186	251
	20	-291	-766	888	1075	1202	1131	996	109
	10	-712	-1173	649	796	872	763	601	67
	20	-296	-763	876	1059	1183	1109	974	131
	0	-1120	-1568	422	528	556	410	220	30
	0	-1160	-1603	416	522	548	399	206	38
	10	-2436	-2855	-239	-251	-373	-636	-919	-77
	20	-3798	-4216	-821	-951	-1224	-1616	-2007	-78
	30	-5185	-5607	-1418	-1664	-2082	-2600	-3103	-113
	40	-6632	-7047	-2035	-2400	-2972	-3629	-4255	-156
	50	-8074	-8482	-2632	-3107	-3823	-4621	-5374	-230
+7.33g	60	-9590	-9995	-3204	-3783	-4642	-5591	-6486	-284
	70	-11197	-11601	-3760	-4436	-5434	-6551	-7606	-335
26deg.	80	-12909	-13321	-4280	-5043	-6178	-7481	-8719	-364
Wing	90	-14788	-15224	-4749	-5589	-6865	-8384	-9843	-360
Sweep	100	-17041	-17555	-5107	-6016	-7473	-9272	-11021	-283
	80	-14592	-15122	-3806	-4493	-5671	-7258	-8837	98
	50	-10497	-11023	-1913	-2223	-2922	-4120	-5377	363
	20	-6095	-6593	-107	-67	-304	-1079	-1956	498
	10	-4462	-4949	478	626	539	-73	-800	512
	20	-5756	-6235	-205	-168	-399	-1120	-1930	297
	0	-2917	-3404	1022	1263	1310	852	275	536

Table B3: F111 Wing Test - Large Configuration
Complete CPLT Load and Strain Histories at FFVH#13, FFVH#14 and SRO#2

Load Case	Nominal %Load Level	Gauge ID							
		302-2	302-3	302-4	302-5	303-1	303-2	303-3	303-4
						Strain (microstrain)			
	0	608	754	808	805	300	351	427	396
	10	671	878	964	973	532	613	736	729
	20	711	979	1104	1128	767	879	1052	1073
	30	745	1076	1240	1279	1005	1147	1374	1427
	40	793	1187	1389	1441	1244	1419	1701	1787
	50	861	1317	1552	1616	1485	1692	2029	2149
-3.0g	60	935	1453	1720	1794	1726	1965	2360	2515
	70	1008	1588	1889	1972	1967	2239	2695	2887
26deg.	80	1090	1731	2062	2153	2205	2513	3027	3253
Wing	90	1165	1868	2232	2331	2444	2790	3366	3626
Sweep	100	1236	2001	2395	2503	2682	3068	3706	3997
	80	1018	1658	1999	2098	2190	2506	3042	3282
	50	651	1094	1348	1428	1423	1650	2038	2208
	20	313	558	719	775	669	804	1048	1148
	10	205	384	512	560	420	524	719	797
	20	334	570	720	768	671	807	1051	1154
	0	106	220	317	355	177	251	399	455
	0	112	222	313	350	183	256	401	455
	10	-173	-241	-241	-234	-521	-529	-511	-515
	20	-334	-587	-699	-738	-1243	-1339	-1457	-1526
	30	-536	-972	-1186	-1264	-1963	-2146	-2401	-2536
	40	-749	-1371	-1689	-1807	-2690	-2960	-3355	-3557
	50	-990	-1783	-2190	-2338	-3402	-3759	-4289	-4559
+7.33g	60	-1208	-2172	-2669	-2849	-4111	-4555	-5222	-5563
	70	-1422	-2555	-3139	-3347	-4813	-5344	-6150	-6566
26deg.	80	-1612	-2908	-3579	-3815	-5502	-6119	-7068	-7566
Wing	90	-1761	-3215	-3973	-4238	-6181	-6885	-7985	-8578
Sweep	100	-1815	-3413	-4259	-4557	-6821	-7619	-8911	-9663
	80	-1062	-2336	-3064	-3356	-5402	-6033	-7065	-7697
	50	-270	-1016	-1476	-1677	-3227	-3595	-4215	-4648
	20	371	168	4	-86	-1049	-1153	-1351	-1573
	10	548	532	478	429	-328	-342	-395	-540
	20	149	-35	-149	-201	-1053	-1154	-1341	-1546
	0	724	880	925	913	352	423	509	439

Table B3: F111 Wing Test - Large Configuration
Complete CPLT Load and Strain Histories at FFVH#13, FFVH#14 and SRO#2

Load Case	Nominal %Load Level	Gauge ID							
		303-5	73-1	73-2	73-3	73-4	73-5	260-1	260-2
					Strain (microstrain)				
	0	262	343	497	229	-1992	-305	281	181
	10	609	708	894	680	-1598	-19	205	-137
	20	970	1089	1317	1199	-1149	283	129	-461
	30	1341	1485	1764	1770	-652	592	32	-818
	40	1720	1886	2220	2369	-137	893	-87	-1196
	50	2099	2288	2675	2962	370	1187	-213	-1577
-3.0g	60	2482	2693	3138	3577	891	1476	-346	-1963
	70	2871	3106	3613	4225	1434	1762	-487	-2354
26deg.	80	3253	3510	4076	4842	1948	2046	-623	-2742
Wing	90	3641	3921	4553	5498	2486	2328	-765	-3133
Sweep	100	4026	4331	5032	6168	3029	2608	-907	-3523
	80	3276	3544	4171	5212	2181	1968	-689	-2723
	50	2160	2365	2911	3827	978	1093	-366	-1620
	20	1061	1215	1680	2475	-196	235	-59	-551
	10	696	833	1271	2025	-587	-51	39	-197
	20	1068	1227	1695	2492	-177	251	-78	-594
	0	340	461	872	1586	-970	-333	132	146
	0	341	461	872	1574	-975	-328	129	116
	10	-660	-570	-224	378	-2027	-1162	233	872
	20	-1709	-1663	-1399	-928	-3196	-2123	284	1653
	30	-2757	-2760	-2584	-2260	-4384	-3091	331	2444
	40	-3818	-3875	-3796	-3646	-5612	-4070	386	3260
	50	-4857	-4959	-4980	-5017	-6813	-5005	458	4069
+7.33g	60	-5898	-6051	-6184	-6455	-8066	-5949	528	4883
	70	-6940	-7145	-7400	-7959	-9370	-6891	609	5708
26deg.	80	-7982	-8240	-8632	-9537	-10755	-7839	702	6547
Wing	90	-9044	-9360	-9904	-11235	-12290	-8815	822	7406
Sweep	100	-10203	-10550	-11261	-13159	-14232	-9930	1059	8386
	80	-8167	-8433	-8997	-10692	-12052	-8146	826	6679
	50	-4998	-5111	-5423	-6727	-8486	-5179	675	4216
	20	-1801	-1760	-1779	-2555	-4754	-2198	530	1812
	10	-726	-633	-537	-1069	-3441	-1217	472	1029
	20	-1766	-1706	-1680	-2316	-4536	-2073	634	1883
	0	288	413	617	333	-2221	-359	379	303

Table B3: F111 Wing Test - Large Configuration
Complete CPLT Load and Strain Histories at FFVH#13, FFVH#14 and SRO#2

Load Case	Nominal %Load Level	Gauge ID							
		260-3	260-4	260-5	75-1	75-2	75-3	75-4	75-5
					Strain (microstrain)				
	0	1126	-189	-115	295	442	318	-19	96
	10	734	-408	-285	642	896	847	427	339
	20	319	-636	-464	989	1378	1437	887	574
	30	-138	-878	-654	1356	1910	2101	1389	823
	40	-618	-1122	-844	1739	2480	2819	1916	1077
	50	-1098	-1364	-1031	2126	3057	3543	2450	1334
-3.0g	60	-1587	-1606	-1219	2515	3653	4295	2991	1586
	70	-2092	-1847	-1408	2909	4274	5083	3541	1829
26deg.	80	-2581	-2088	-1594	3301	4887	5848	4087	2079
Wing	90	-3069	-2328	-1782	3705	5539	6657	4640	2321
Sweep	100	-3555	-2567	-1969	4116	6214	7487	5194	2556
	80	-2655	-2034	-1563	3310	5178	6285	4094	1896
	50	-1383	-1312	-1014	2119	3675	4587	2600	1045
	20	-129	-605	-474	963	2218	2942	1158	226
	10	288	-368	-293	583	1738	2400	684	-44
	20	-171	-624	-486	985	2250	2986	1213	272
	0	694	-138	-116	215	1273	1875	224	-304
	0	638	-149	-120	230	1278	1864	238	-280
	10	1595	410	313	-678	150	602	-869	-912
	20	2633	1022	794	-1634	-1050	-756	-2069	-1617
	30	3704	1648	1288	-2566	-2234	-2117	-3251	-2302
	40	4820	2285	1789	-3503	-3451	-3545	-4456	-2988
	50	5922	2903	2273	-4419	-4660	-4976	-5634	-3651
+7.33g	60	7062	3523	2762	-5329	-5903	-6473	-6817	-4295
	70	8237	4140	3248	-6236	-7184	-8030	-8006	-4921
26deg.	80	9462	4755	3734	-7136	-8496	-9648	-9209	-5530
Wing	90	10730	5374	4225	-8034	-9856	-11362	-10465	-6126
Sweep	100	12225	5977	4707	-8894	-11246	-13254	-11918	-6713
	80	10091	4756	3776	-6992	-8891	-10621	-9549	-5282
	50	6806	2844	2282	-4165	-5351	-6612	-5945	-3135
	20	3524	954	790	-1368	-1747	-2429	-2315	-1067
	10	2438	343	306	-437	-500	-933	-1096	-420
	20	3474	936	757	-1420	-1731	-2322	-2336	-1146
	0	1444	-198	-121	450	706	514	33	143

Table B3: F111 Wing Test - Large Configuration
Complete CPLT Load and Strain Histories at FFVH#13, FFVH#14 and SRO#2

Load Case	Nominal %Load Level	Gauge ID							
		76-1	76-2	76-3	76-4	76-5	59\60-1	59\60-2	59\60-3
					Strain (microstrain)				
	0	-382	207	164	145	3	455	552	654
	10	-144	601	447	257	-118	823	966	1105
	20	85	997	724	365	-238	1193	1398	1588
	30	320	1412	1020	496	-341	1573	1851	2101
	40	561	1846	1327	637	-439	1956	2314	2633
	50	809	2286	1640	781	-539	2324	2763	3149
-3.0g	60	1050	2730	1952	925	-638	2691	3215	3673
	70	1229	3180	2258	1065	-739	3062	3682	4223
26deg.	80	1436	3627	2569	1211	-836	3412	4119	4737
Wing	90	1494	4081	2874	1355	-934	3769	4575	5284
Sweep	100	1560	4536	3173	1499	-1030	4122	5034	5841
	80	1104	3629	2443	1140	-864	3482	4325	5071
	50	501	2330	1474	710	-543	2425	3150	3794
	20	-65	1072	553	312	-213	1364	1974	2517
	10	-250	659	254	185	-102	1002	1573	2082
	20	-20	1108	601	352	-200	1348	1955	2496
	0	-431	258	-34	66	9	634	1166	1643
	0	-460	282	11	106	15	623	1151	1623
	10	-924	-643	-617	-114	312	-215	221	613
	20	-1397	-1624	-1310	-383	605	-1133	-794	-486
	30	-1926	-2598	-1991	-637	919	-2096	-1859	-1639
	40	-2503	-3565	-2655	-879	1228	-3145	-3024	-2901
	50	-3120	-4518	-3314	-1115	1542	-4161	-4162	-4145
+7.33g	60	-3723	-5468	-3958	-1338	1863	-5182	-5329	-5436
	70	-4326	-6416	-4590	-1550	2192	-6195	-6510	-6764
26deg.	80	-4920	-7360	-5208	-1750	2523	-7190	-7699	-8121
Wing	90	-5497	-8315	-5818	-1943	2861	-8185	-8916	-9526
Sweep	100	-6066	-9310	-6400	-2116	3208	-9181	-10172	-10978
	80	-4660	-7377	-5003	-1624	2559	-7251	-8045	-8678
	50	-3076	-4495	-2988	-922	1591	-4215	-4703	-5064
	20	-1597	-1612	-1025	-227	645	-1282	-1433	-1502
	10	-1125	-639	-377	3	331	-358	-372	-324
	20	-1653	-1656	-1105	-293	617	-1221	-1326	-1359
	0	-668	298	227	202	13	529	662	834

Table B3: F111 Wing Test - Large Configuration
Complete CPLT Load and Strain Histories at FFVH#13, FFVH#14 and SRO#2

Load Case	Nominal %Load Level	Gauge ID							
		59\60-4	59\60-5	359\360-1	359\360-2	359\360-3	359\360-4	350\360-5	36\37-1
						Strain (microstrain)			
	0	461	715	256	399	366	232	303	44
	10	929	1197	748	845	733	537	546	168
	20	1433	1719	1299	1330	1116	847	790	301
	30	1971	2275	1892	1847	1518	1163	1038	440
	40	2528	2849	2511	2386	1929	1483	1286	581
	50	3070	3408	3113	2913	2333	1797	1529	726
-3.0g	60	3623	3976	3729	3451	2741	2108	1769	873
	70	4202	4566	4368	4012	3159	2418	2006	1022
26deg.	80	4744	5116	4961	4534	3555	2716	2234	1172
Wing	90	5319	5691	5581	5080	3961	3011	2457	1326
Sweep	100	5905	6264	6197	5624	4364	3298	2673	1479
	80	5096	5420	5337	4814	3662	2686	2174	1196
	50	3759	4034	3925	3489	2520	1697	1371	756
	20	2423	2653	2521	2177	1394	727	587	316
	10	1970	2185	2047	1735	1017	404	326	174
	20	2403	2634	2502	2161	1383	720	583	315
	0	1512	1715	1571	1294	642	82	69	35
	0	1492	1695	1550	1278	636	82	72	40
	10	434	594	426	218	-283	-717	-581	-262
	20	-712	-593	-786	-918	-1261	-1565	-1272	-545
	30	-1913	-1833	-2054	-2099	-2273	-2436	-1982	-801
	40	-3225	-3188	-3447	-3387	-3365	-3371	-2743	-1025
	50	-4520	-4529	-4835	-4659	-4432	-4277	-3482	-1247
+7.33g	60	-5869	-5925	-6296	-5984	-5521	-5187	-4222	-1466
	70	-7260	-7361	-7818	-7349	-6622	-6086	-4949	-1686
26deg.	80	-8686	-8828	-9396	-8752	-7728	-6968	-5653	-1907
Wing	90	-10165	-10356	-11071	-10226	-8860	-7843	-6333	-2132
Sweep	100	-11702	-12001	-12939	-11851	-10082	-8774	-6962	-2364
	80	-9291	-9495	-10382	-9437	-7979	-6937	-5454	-1918
	50	-5515	-5580	-6380	-5672	-4718	-4100	-3135	-1264
	20	-1793	-1713	-2383	-1972	-1586	-1419	-959	-538
	10	-557	-420	-1022	-737	-573	-574	-282	-249
	20	-1643	-1552	-2178	-1825	-1518	-1398	-955	-547
	0	660	851	326	480	409	232	359	50

Table B3: F111 Wing Test - Large Configuration
Complete CPLT Load and Strain Histories at FFVH#13, FFVH#14 and SRO#2

Load Case	Nominal %Load Level	Gauge ID			
		36\37-2	36\37-3	36\37-4	36\37-5
		Strain (microstrain)			
	0	42	40	40	43
	10	150	136	128	128
	20	267	239	222	214
	30	388	345	316	302
	40	510	451	411	389
	50	638	562	510	479
-3.0g	60	766	675	610	571
	70	897	790	712	663
26deg.	80	1030	906	816	758
Wing	90	1165	1025	921	853
Sweep	100	1300	1144	1026	948
	80	1046	914	812	743
	50	654	561	486	434
	20	263	210	161	124
	10	136	96	56	24
	20	263	210	162	125
	0	14	-13	-46	-73
	0	19	-8	-40	-68
	10	-246	-242	-252	-267
	20	-488	-454	-444	-446
	30	-705	-639	-608	-597
	40	-888	-790	-736	-712
	50	-1069	-938	-860	-821
+7.33g	60	-1245	-1077	-973	-917
	70	-1419	-1213	-1079	-1001
26deg.	80	-1593	-1345	-1178	-1076
Wing	90	-1768	-1475	-1271	-1142
Sweep	100	-1946	-1604	-1358	-1195
	80	-1588	-1317	-1121	-991
	50	-1061	-893	-770	-687
	20	-454	-384	-329	-288
	10	-208	-172	-143	-118
	20	-468	-402	-352	-314
	0	49	49	51	57

Table B4: F111 Wing Test - Baseline Configuration
Zero and 100% Strain Histories

Load Case	Nominal %Load Level	Gauge ID							
		77-1	77-2	77-3	78-1	78-2	78-3	79-1	79-2
		Strain (microstrain)							
-2.4g	0	16	-84	93	-14	1	1	7	20
56deg.	100	975	-222	1357	916	-258	904	936	-276
Wing	delta	960	-138	1264	930	-259	903	929	-296
Sweep	0	-8	-102	74	-47	-6	-22	-7	3
+7.33g	0	56	-110	96	90	-28	59	57	-40
56deg.	100	-3880	-1856	-6527	-3393	342	-3625	-2672	-366
Wing	delta	-3936	-1746	-6623	-3483	370	-3684	-2729	-326
Sweep	0	75	-142	35	156	-1	163	74	-44
-3.0g	0	53	-131	20	114	9	135	56	-20
26deg.	100	1248	-305	1651	1217	-345	1158	1206	-383
Wing	delta	1195	-173	1632	1103	-354	1023	1150	-363
Sweep	0	-9	-138	37	-17	-22	-15	4	-15
+7.33g	0	62	-144	12	140	-6	136	71	-46
26deg.	100	-3974	-1854	-6672	-3421	372	-3638	-2719	-339
Wing	delta	-4036	-1710	-6684	-3561	378	-3774	-2790	-293
Sweep	0	72	-152	-12	173	7	189	79	-44

Load Case	Nominal %Load Level	Gauge ID							
		79-3	80-1	80-2	80-3	81-1	81-2	81-3	82-1
		Strain (microstrain)							
-2.4g	0	0	12	2	-3	-32	4	14	-14
56deg.	100	405	1098	-123	906	-390	867	955	-329
Wing	delta	405	1086	-125	909	-358	863	941	-315
Sweep	0	-36	65	-19	43	-26	-8	9	-7
+7.33g	0	27	52	-1	61	-18	46	55	-23
56deg.	100	-1553	-3636	-198	-2099	1777	-3272	-3372	1681
Wing	delta	-1580	-3688	-197	-2160	1795	-3318	-3428	1704
Sweep	0	39	55	10	66	-5	46	15	-21
-3.0g	0	31	25	17	39	-10	21	-9	-24
26deg.	100	516	1384	-165	1150	-473	1122	1209	-435
Wing	delta	485	1359	-182	1111	-463	1100	1217	-411
Sweep	0	-34	73	-23	56	-11	1	5	-27
+7.33g	0	39	43	9	64	2	38	21	-22
26deg.	100	-1540	-3700	-179	-2110	1832	-3343	-3417	1699
Wing	delta	-1579	-3743	-188	-2174	1830	-3381	-3437	1721
Sweep	0	47	49	15	70	7	39	-4	-23

Table B4: F111 Wing Test - Baseline Configuration
Zero and 100% Strain Histories

Load Case	Nominal %Load Level	Gauge ID							
		82-2	82-3	83-1	83-2	83-3	84-1	84-2	84-3
		Strain (microstrain)							
-2.4g	0	23	4	-10	-12	3	-8	-3	13
56deg.	100	1270	1012	-428	889	766	-148	838	1010
Wing	delta	1247	1008	-418	901	763	-140	841	997
Sweep	0	-5	-27	1	-12	29	17	-36	26
+7.33g	0	56	12	-23	73	42	-5	31	49
56deg.	100	-4673	-3367	2058	-3343	-2586	1013	-2787	-3219
Wing	delta	-4729	-3379	2081	-3416	-2628	1018	-2818	-3268
Sweep	0	113	71	-35	87	42	2	33	43
-3.0g	0	76	56	-32	47	23	-7	17	18
26deg.	100	1612	1265	-545	1144	964	-191	1077	1273
Wing	delta	1536	1209	-513	1097	941	-184	1060	1255
Sweep	0	-11	-50	1	-7	29	16	-39	21
+7.33g	0	71	49	-30	75	39	-1	30	36
26deg.	100	-4814	-3431	2077	-3405	-2640	1021	-2831	-3291
Wing	delta	-4885	-3480	2107	-3480	-2679	1022	-2861	-3327
Sweep	0	97	78	-38	87	45	3	32	38

Load Case	Nominal %Load Level	Gauge ID							
		38\W6	39	40	71	74	85	86	87
		Strain (microstrain)							
-2.4g									
-2.4g	0	33	38	39	26	39	118	79	49
56deg.	100	1321	1478	1555	1501	1943	2654	2041	2638
Wing	delta	1288	1440	1516	1475	1904	2536	1962	2589
Sweep	0	45	37	50	19	29	218	113	147
+7.33g	0	37	51	24	56	63	27	47	-57
56deg.	100	-4765	-4409	-4335	-5497	-6190	-8839	-6394	-8963
Wing	delta	-4802	-4460	-4359	-5553	-6253	-8866	-6441	-8906
Sweep	0	47	53	31	73	98	-375	-67	-522
-3.0g	0	35	45	29	52	78	-350	-60	-502
26deg.	100	1688	1865	1947	1920	2464	3373	2579	3298
Wing	delta	1653	1820	1918	1868	2386	3723	2639	3800
Sweep	0	62	42	55	21	38	257	129	118
+7.33g	0	42	52	32	59	87	-298	-48	-449
26deg.	100	-4826	-4457	-4367	-5584	-6255	-9054	-6511	-9203
Wing	delta	-4868	-4509	-4399	-5643	-6342	-8756	-6463	-8754
Sweep	0	40	53	35	73	109	-486	-111	-662

Table B4: F111 Wing Test - Baseline Configuration
Zero and 100% Strain Histories

Load Case	Nominal %Load Level	Gauge ID							
		88	35	58	90-1	90-2	90-3	91-1	91-2
		Strain (microstrain)							
-2.4g	0	78	47	9	36	24	-13	30	14
56deg.	100	2141	1551	664	1270	701	-458	1175	496
Wing	delta	2063	1504	655	1234	677	-445	1145	482
Sweep	0	114	49	11	37	16	-18	24	8
+7.33g	0	40	50	33	39	37	-3	51	18
56deg.	100	-6521	-4231	-2245	-3049	-131	1884	-4337	-639
Wing	delta	-6561	-4281	-2278	-3088	-168	1887	-4388	-657
Sweep	0	-62	55	49	39	39	0	65	21
-3.0g	0	-54	47	38	36	32	-5	55	19
26deg.	100	2706	1941	908	1608	844	-566	1501	590
Wing	delta	2760	1894	870	1572	812	-561	1446	571
Sweep	0	132	53	19	39	13	-18	38	7
+7.33g	0	-43	56	48	43	42	-3	63	22
26deg.	100	-6630	-4261	-2289	-3082	-89	1891	-4413	-635
Wing	delta	-6587	-4317	-2337	-3125	-131	1894	-4476	-657
Sweep	0	-98	60	57	45	46	-1	68	26

Load Case	Nominal %Load Level	Gauge ID							
		91-3	92-1	92-2	92-3	95-1	95-2	95-3	96-1
		Strain (microstrain)							
-2.4g	0	-11	28	7	-9	39	8	-8	40
56deg.	100	-406	1272	303	-451	1320	242	-334	1504
Wing	delta	-395	1244	296	-442	1281	234	-326	1464
Sweep	0	-13	25	11	-13	40	8	-3	36
+7.33g	0	-7	45	7	-8	44	10	-15	51
56deg.	100	2382	-4158	-1665	2196	-3441	-416	881	-4120
Wing	delta	2389	-4203	-1672	2204	-3485	-426	896	-4171
Sweep	0	-7	54	4	-7	45	12	-11	61
-3.0g	0	-9	46	4	-8	41	8	-9	51
26deg.	100	-510	1624	379	-579	1665	286	-403	1893
Wing	delta	-501	1578	375	-571	1624	278	-394	1842
Sweep	0	-14	34	13	-14	43	8	-2	43
+7.33g	0	-9	54	5	-10	49	12	-14	60
26deg.	100	2440	-4194	-1735	2209	-3462	-411	873	-4149
Wing	delta	2449	-4248	-1740	2219	-3511	-423	887	-4209
Sweep	0	-9	57	4	-7	52	16	-13	67

Table B4: F111 Wing Test - Baseline Configuration
Zero and 100% Strain Histories

Load Case	Nominal %Load Level	Gauge ID							
		96-2	96-3	97-1	97-2	97-3	25-1	25-2	25-3
		Strain (microstrain)							
-2.4g	0	11	**	38	44	-3	-8	58	-28
56deg.	100	271	**	1504	395	-430	-326	1780	133
Wing	delta	260	**	1466	351	-427	-318	1722	161
Sweep	0	8	**	38	36	-8	-7	35	-26
+7.33g	0	15	**	52	59	9	-9	116	17
56deg.	100	-402	**	-4008	-833	1634	505	-4540	-869
Wing	delta	-417	**	-4060	-892	1625	514	-4656	-886
Sweep	0	19	**	62	72	16	-11	122	12
-3.0g	0	16	**	51	46	12	-15	100	-11
26deg.	100	316	**	1881	469	-540	-424	2199	168
Wing	delta	300	**	1830	423	-552	-409	2099	179
Sweep	0	6	**	44	24	-5	-11	39	-32
+7.33g	0	18	**	61	64	12	-11	112	7
26deg.	100	-396	**	-4024	-848	1667	507	-4602	-885
Wing	delta	-414	**	-4085	-912	1655	518	-4714	-892
Sweep	0	22	**	66	77	17	-12	120	12

Load Case	Nominal %Load Level	Gauge ID					
		26-1	26-2	26-3	27-1	27-2	27-3
		Strain (microstrain)					
-2.4g	0	-3	53	23	-4	65	-15
56deg.	100	102	1598	162	-137	1399	-584
Wing	delta	105	1545	139	-133	1334	-569
Sweep	0	14	40	18	-9	4	-29
+7.33g	0	16	81	-15	3	95	-25
56deg.	100	113	-3672	-229	-714	-3784	1218
Wing	delta	97	-3753	-214	-717	-3879	1243
Sweep	0	12	90	-12	11	110	-17
-3.0g	0	0	81	-2	5	99	-18
26deg.	100	142	1988	210	-187	1747	-744
Wing	delta	142	1907	212	-192	1648	-726
Sweep	0	13	47	14	0	8	-37
+7.33g	0	7	86	-14	8	98	-30
26deg.	100	113	-3706	-230	-730	-3890	1224
Wing	delta	106	-3792	-216	-738	-3988	1254
Sweep	0	8	92	-12	12	108	-25

Table B5: F111 Wing Test - Intermediate Configuration
Zero and 100% Strain Histories

Load Case	Nominal %Load Level	Gauge ID							
		77-1	77-2	77-3	78-1	78-2	78-3	79-1	79-2
		Strain (microstrain)							
-2.4g	0	64	-27	73	70	-16	45	42	-7
56deg.	100	1173	-231	1605	1431	-396	706	877	-333
Wing	delta	1109	-204	1532	1361	-380	661	835	-325
Sweep	0	12	-47	48	-81	2	-15	-13	29
+7.33g	0	12	-42	59	-84	2	-17	-14	27
56deg.	100	-4151	-2012	-7726	-4742	1144	-2371	-2307	-133
Wing	delta	-4163	-1970	-7785	-4658	1142	-2355	-2293	-160
Sweep	0	229	-161	-88	693	-109	497	125	-11
-3.0g	0	209	-146	-99	630	-99	468	104	12
26deg.	100	1557	-390	1877	2173	-565	1094	1157	-447
Wing	delta	1348	-244	1976	1543	-467	626	1053	-459
Sweep	0	111	-141	-43	271	-64	207	35	21
+7.33g	0	122	-151	-52	292	-66	197	59	-28
26deg.	100	-4242	-2030	-7912	-4729	1148	-2350	-2335	-110
Wing	delta	-4363	-1879	-7860	-5021	1214	-2547	-2394	-82
Sweep	0	226	-189	-171	758	-122	540	133	-19

Load Case	Nominal %Load Level	Gauge ID							
		79-3	80-1	80-2	80-3	81-1	81-2	81-3	82-1
		Strain (microstrain)							
-2.4g	0	23	54	-2	52	-11	41	59	-13
56deg.	100	244	1094	-131	903	-467	989	1160	-348
Wing	delta	221	1040	-129	851	-456	947	1101	-334
Sweep	0	-23	74	-24	38	-16	15	22	1
+7.33g	0	-23	73	-23	36	-17	13	24	1
56deg.	100	-806	-3588	-212	-2004	2066	-3621	-4205	1534
Wing	delta	-783	-3661	-189	-2040	2083	-3635	-4229	1534
Sweep	0	89	80	3	81	-48	113	-125	-42
-3.0g	0	79	52	11	51	-49	94	-142	-40
26deg.	100	340	1378	-175	1135	-595	1280	1343	-461
Wing	delta	261	1325	-186	1084	-546	1186	1485	-421
Sweep	0	13	94	-29	57	-39	54	-92	-27
+7.33g	0	34	97	-29	79	-25	64	-56	-20
26deg.	100	-780	-3639	-202	-2015	2118	-3674	-4276	1557
Wing	delta	-814	-3736	-173	-2093	2143	-3737	-4220	1577
Sweep	0	102	76	2	87	-31	116	-158	-38

Table B5: F111 Wing Test - Intermediate Configuration
Zero and 100% Strain Histories

Load Case	Nominal %Load Level	Gauge ID							
		82-2	82-3	83-1	83-2	83-3	84-1	84-2	84-3
		Strain (microstrain)							
-2.4g	0	71	58	-10	31	31	-6	30	49
56deg.	100	1616	1098	-451	769	623	-128	812	1045
Wing	delta	1545	1040	-441	738	592	-122	782	996
Sweep	0	-13	17	13	-42	21	11	-31	28
+7.33g	0	-14	15	11	-42	21	10	-26	34
56deg.	100	-5476	-3468	2011	-2970	-2157	906	-2624	-3326
Wing	delta	-5461	-3483	2000	-2928	-2178	896	-2598	-3360
Sweep	0	339	233	-62	100	67	-22	75	51
-3.0g	0	303	216	-55	66	50	-23	62	30
26deg.	100	2168	1424	-590	1019	793	-172	1062	1307
Wing	delta	1865	1208	-535	953	743	-149	1000	1276
Sweep	0	123	72	-11	-6	44	1	-5	34
+7.33g	0	146	76	-12	38	63	0	35	59
26deg.	100	-5600	-3512	2025	-3006	-2200	916	-2634	-3371
Wing	delta	-5746	-3587	2038	-3045	-2263	916	-2669	-3429
Sweep	0	350	252	-64	109	73	-14	87	61

Load Case	Nominal %Load Level	Gauge ID							
		287	38\W6	288	39	289	40	290	71
		Strain (microstrain)							
-2.4g	0	59	56	60	67	83	69	52	61
56deg.	100	1508	1468	1622	1604	1871	1691	1617	1470
Wing	delta	1449	1411	1562	1536	1788	1622	1565	1409
Sweep	0	85	68	53	54	84	96	138	28
+7.33g	0	85	70	55	58	86	94	132	30
56deg.	100	-5936	-5252	-4905	-4696	-4941	-4539	-4137	-5234
Wing	delta	-6020	-5322	-4959	-4754	-5027	-4633	-4269	-5264
Sweep	0	58	31	130	64	114	65	69	117
-3.0g	0	47	27	118	57	103	67	82	100
26deg.	100	1897	1818	2069	1992	2341	2082	2001	1879
Wing	delta	1850	1790	1951	1935	2238	2015	1919	1779
Sweep	0	95	56	96	54	105	93	149	57
+7.33g	0	87	53	103	57	106	87	99	64
26deg.	100	-6045	-5317	-4961	-4743	-4983	-4561	-4155	-5319
Wing	delta	-6132	-5369	-5064	-4800	-5088	-4648	-4254	-5383
Sweep	0	35	21	130	54	102	61	62	110

Table B5: F111 Wing Test - Intermediate Configuration
Zero and 100% Strain Histories

Load Case	Nominal %Load Level	Gauge ID							
		74	261	262	263	272	273	274	275
		Strain (microstrain)							
-2.4g	0	87	63	31	18	44	73	40	7
56deg.	100	2061	769	634	658	808	985	368	357
Wing	delta	1974	706	603	639	764	911	328	350
Sweep	0	51	-125	-87	-17	111	-84	-166	-66
+7.33g	0	55	-120	-78	-21	98	-81	-158	-79
56deg.	100	-6438	-2150	-2110	-2703	-1567	-3749	-2174	-488
Wing	delta	-6493	-2030	-2032	-2681	-1665	-3668	-2015	-408
Sweep	0	116	47	94	49	53	35	-38	79
-3.0g	0	101	4	60	66	16	-3	-94	66
26deg.	100	2567	962	806	865	1038	1237	414	535
Wing	delta	2466	958	747	799	1022	1241	508	469
Sweep	0	53	-138	-89	-16	136	-105	-240	-34
+7.33g	0	59	17	-85	-16	127	-45	-152	-37
26deg.	100	-6497	-2169	-2126	-2722	-1604	-3833	-2254	-566
Wing	delta	-6556	-2186	-2041	-2706	-1731	-3788	-2102	-529
Sweep	0	116	46	92	48	53	17	-58	82

Load Case	Nominal %Load Level	Gauge ID							
		279	280	281	282	35	58	91-1	91-2
		Strain (microstrain)							
-2.4g	0	41	254	58	29	71	13	48	35
56deg.	100	929	-346	1248	1134	1661	681	1237	522
Wing	delta	888	-600	1189	1105	1590	668	1189	487
Sweep	0	-3	-1149	-8	-52	72	-9	26	20
+7.33g	0	7	-728	21	-51	74	-6	27	18
56deg.	100	-2452	-953	-2067	-3379	-4446	-2372	-4479	-575
Wing	delta	-2459	-226	-2087	-3328	-4520	-2366	-4506	-594
Sweep	0	80	3	219	31	70	27	59	44
-3.0g	0	93	95	167	14	70	19	54	44
26deg.	100	1152	182	1438	1422	2054	920	1546	613
Wing	delta	1059	88	1270	1408	1984	900	1492	569
Sweep	0	1	-571	-1	-61	76	-7	33	27
+7.33g	0	70	176	-19	-13	73	-1	38	29
26deg.	100	-2475	-668	-2248	-3425	-4464	-2430	-4554	-568
Wing	delta	-2545	-844	-2229	-3412	-4537	-2429	-4591	-596
Sweep	0	93	368	161	33	69	24	58	49

Table B5: F111 Wing Test - Intermediate Configuration
Zero and 100% Strain Histories

Load Case	Nominal %Load Level	Gauge ID							
		91-3	92-1	92-2	92-3	96-1	96-2	96-3	97-1
		Strain (microstrain)							
-2.4g	0	-9	58	15	-12	65	25	-19	68
56deg.	100	-428	1361	361	-481	1603	294	-585	1604
Wing	delta	-419	1303	346	-469	1538	269	-566	1536
Sweep	0	-12	41	20	-16	53	13	-18	58
+7.33g	0	-15	46	17	-18	56	13	-17	60
56deg.	100	2481	-4341	-1829	2309	-4322	-420	2064	-4204
Wing	delta	2495	-4387	-1847	2327	-4378	-433	2080	-4264
Sweep	0	-12	67	0	-12	70	27	-11	74
-3.0g	0	-15	61	1	-11	66	24	-11	66
26deg.	100	-537	1713	425	-613	1992	340	-715	1980
Wing	delta	-522	1651	424	-602	1925	316	-705	1913
Sweep	0	-20	45	14	-18	56	12	-17	57
+7.33g	0	-19	36	7	-19	54	6	-23	60
26deg.	100	2542	-4387	-1905	2318	-4347	-421	2082	-4213
Wing	delta	2561	-4423	-1913	2337	-4401	-427	2105	-4274
Sweep	0	-15	49	-3	-12	67	21	-15	71

Load Case	Nominal %Load Level	Gauge ID							
		97-2	97-3	25-1	25-2	25-3	26-1	26-2	26-3
		Strain (microstrain)							
-2.4g	0	23	-8	-18	101	18	2	90	3
56deg.	100	371	-475	-348	1888	144	104	1703	181
Wing	delta	347	-467	-331	1787	126	102	1613	179
Sweep	0	1	-27	-10	41	-26	10	57	34
+7.33g	0	9	-25	-13	48	-22	10	60	28
56deg.	100	-865	1713	524	-4779	-899	91	-3847	-206
Wing	delta	-874	1738	537	-4827	-877	82	-3907	-234
Sweep	0	42	-2	-21	113	18	2	99	-1
-3.0g	0	41	-4	-19	98	0	-5	91	12
26deg.	100	456	-586	-442	2297	179	144	2082	228
Wing	delta	415	-582	-423	2199	179	149	1991	216
Sweep	0	17	-25	-14	39	-26	8	56	33
+7.33g	0	11	-22	-3	63	3	22	60	4
26deg.	100	-849	1728	540	-4806	-906	107	-3872	-207
Wing	delta	-861	1750	542	-4868	-909	84	-3932	-212
Sweep	0	40	-5	-8	119	26	17	96	-2

Table B5: F111 Wing Test - Intermediate Configuration
Zero and 100% Strain Histories

Load Case	Nominal %Load Level	Gauge ID							
		278-1	278-2	278-3	27-1	27-2	27-3	264-1	264-2
		Strain (microstrain)							
-2.4g	0	19	92	-43	5	85	-38	19	112
56deg.	100	133	1589	-755	-148	1478	-627	181	1945
Wing	delta	114	1497	-712	-153	1393	-588	163	1832
Sweep	0	-26	64	23	-7	2	-38	-116	-51
+7.33g	0	-24	67	15	-6	10	-46	-109	-40
56deg.	100	-922	-4144	1560	-725	-3988	1272	-602	-4481
Wing	delta	-898	-4212	1545	-719	-3999	1319	-494	-4441
Sweep	0	15	131	-48	2	86	-37	16	169
-3.0g	0	1	116	-36	-1	80	-32	-20	123
26deg.	100	148	1944	-953	-206	1805	-794	262	2438
Wing	delta	147	1828	-917	-206	1725	-761	283	2315
Sweep	0	-31	92	20	-6	-5	-49	-119	-18
+7.33g	0	-4	108	-8	0	20	-60	-51	49
26deg.	100	-929	-4193	1568	-738	-4075	1274	-594	-4503
Wing	delta	-925	-4300	1575	-738	-4095	1334	-542	-4551
Sweep	0	22	127	-46	7	84	-37	29	175

Load Case	Nominal %Load Level	Gauge ID							
		264-3	265-1	265-2	265-3	266-1	266-2	266-3	267-1
		Strain (microstrain)							
-2.4g	0	-4	-35	62	-25	-36	80	3	-27
56deg.	100	58	-287	1368	-285	-421	1611	10	-310
Wing	delta	62	-252	1305	-259	-385	1531	7	-284
Sweep	0	-41	55	35	11	2	45	15	-18
+7.33g	0	-40	49	40	11	-1	54	14	-26
56deg.	100	80	713	-3244	613	966	-3800	93	1069
Wing	delta	120	665	-3284	603	967	-3854	79	1095
Sweep	0	-6	-37	90	-27	-35	116	-6	-20
-3.0g	0	-18	-12	82	-21	-26	102	-10	-21
26deg.	100	87	-376	1676	-359	-510	1997	25	-376
Wing	delta	105	-364	1595	-338	-484	1895	35	-354
Sweep	0	-46	56	50	9	6	76	14	-29
+7.33g	0	-15	-13	-3	63	3	22	60	4
26deg.	100	101	-3425	540	-4806	-906	107	-3872	-207
Wing	delta	116	-3412	542	-4868	-909	84	-3932	-212
Sweep	0	11	33	-8	119	26	17	96	-2

Table B5: F111 Wing Test - Intermediate Configuration
Zero and 100% Strain Histories

Load Case	Nominal %Load Level	Gauge ID					
		267-2	267-3	268	269	270	271
		Strain (microstrain)					
-2.4g	0	71	-3	-43	-43	-35	-27
56deg.	100	1223	-59	-725	-998	-527	-290
Wing	delta	1152	-56	-682	-955	-492	-263
Sweep	0	8	-5	-64	-125	24	3
+7.33g	0	15	-6	-66	-113	17	-15
56deg.	100	-2565	-691	1521	1510	1011	1429
Wing	delta	-2580	-685	1587	1623	993	1444
Sweep	0	87	-10	-51	-22	-39	-16
-3.0g	0	73	-11	-41	-40	-21	-8
26deg.	100	1522	-77	-914	-1275	-646	-355
Wing	delta	1449	-66	-873	-1234	-625	-348
Sweep	0	16	-7	-66	-144	25	-4
+7.33g	0	-4	108	-8	0	20	-60
26deg.	100	-929	-4193	1568	-738	-4075	1274
Wing	delta	-925	-4300	1575	-738	-4095	1334
Sweep	0	22	127	-46	7	84	-37

Table B6: F111 Wing Test - Large Configuration
Zero and 100% Strain Histories

Load Case	Nominal %Load Level	Gauge ID							
		77-1	77-2	77-3	79-1	79-2	79-3	80-1	80-2
		Strain (microstrain)							
-2.4g	0	51	-20	78	-6	32	8	-7	8
56deg.	100	1122	-250	1781	611	-308	60	938	-113
Wing	delta	1071	-230	1702	617	-339	52	945	-121
Sweep	0	47	-68	94	-33	27	-26	55	-25
+7.33g	0	44	-60	98	-30	21	-24	55	-22
56deg.	100	-2805	-2644	-7716	-1495	-265	-212	-3175	-214
Wing	delta	-2849	-2583	-7814	-1465	-286	-189	-3231	-192
Sweep	0	723	-122	517	93	-18	51	58	2
-3.0g	0	702	-119	506	96	-15	50	60	2
26deg.	100	1791	-385	2496	834	-415	105	1193	-151
Wing	delta	1089	-266	1990	738	-400	56	1134	-153
Sweep	0	457	-124	421	16	23	1	78	-27
+7.33g	0	461	-114	437	18	21	3	79	-25
26deg.	100	-2813	-2641	-7807	-1505	-240	-190	-3205	-203
Wing	delta	-3274	-2527	-8244	-1523	-261	-193	-3283	-178
Sweep	0	785	-130	533	104	-10	62	65	8

Load Case	Nominal %Load Level	Gauge ID							
		80-3	81-1	81-2	81-3	83-1	83-2	83-3	84-1
		Strain (microstrain)							
-2.4g	0	0	-26	25	34	0	-38	-1	-8
56deg.	100	803	-493	825	1208	-332	456	456	-77
Wing	delta	803	-467	801	1174	-332	495	457	-69
Sweep	0	20	-28	27	32	15	-53	14	11
+7.33g	0	24	-24	27	35	12	-48	16	8
56deg.	100	-1809	2189	-3414	-4796	1528	-1872	-1692	703
Wing	delta	-1833	2214	-3441	-4831	1516	-1825	-1708	695
Sweep	0	67	-67	87	-164	-80	96	34	-19
-3.0g	0	66	-66	79	-166	-75	87	33	-21
26deg.	100	1018	-629	1027	1342	-460	643	568	-114
Wing	delta	952	-563	948	1508	-385	555	535	-93
Sweep	0	39	-52	16	-151	-21	-13	16	-3
+7.33g	0	41	-52	18	-144	-23	-10	20	-6
26deg.	100	-1816	2210	-3461	-4919	1526	-1886	-1718	700
Wing	delta	-1857	2262	-3479	-4775	1549	-1876	-1739	706
Sweep	0	78	-58	80	-221	-87	100	39	-23

Table B6: F111 Wing Test - Large Configuration
Zero and 100% Strain Histories

Load Case	Nominal %Load Level	Gauge ID							
		84-2	84-3	287	38\W6	288	39	289	40
		Strain (microstrain)							
-2.4g	0	9	16	55	47	41	50	64	66
56deg.	100	667	970	1565	1363	1481	1517	1747	1580
Wing	delta	658	953	1510	1317	1440	1467	1683	1514
Sweep	0	-33	29	83	66	30	46	68	84
+7.33g	0	-26	34	82	66	31	47	67	81
56deg.	100	-2179	-3114	-6333	-4980	-4538	-4505	-4733	-4302
Wing	delta	-2153	-3148	-6415	-5046	-4569	-4552	-4800	-4383
Sweep	0	74	51	-32	15	107	45	52	41
-3.0g	0	76	50	-19	27	114	56	67	58
26deg.	100	894	1217	1931	1709	1905	1901	2180	1961
Wing	delta	818	1167	1951	1682	1791	1845	2113	1903
Sweep	0	-3	30	37	59	63	47	67	85
+7.33g	0	1	36	39	63	68	52	71	86
26deg.	100	-2189	-3155	-6438	-5041	-4573	-4546	-4764	-4326
Wing	delta	-2190	-3191	-6477	-5105	-4641	-4598	-4836	-4412
Sweep	0	84	54	-47	15	121	48	57	45

Load Case	Nominal %Load Level	Gauge ID							
		290	71	74	261	262	263	272	273
		Strain (microstrain)							
-2.4g	0	87	26	58	-39	11	44	-38	-21
56deg.	100	1518	1335	1905	696	562	580	693	1006
Wing	delta	1432	1308	1846	735	551	536	730	1027
Sweep	0	129	-2	31	-146	-104	-27	89	-91
+7.33g	0	119	-3	31	-131	-93	-29	87	-89
56deg.	100	-3934	-4969	-6130	-2058	-1985	-2483	-1321	-3835
Wing	delta	-4053	-4966	-6161	-1927	-1892	-2454	-1408	-3745
Sweep	0	31	101	75	26	74	40	53	49
-3.0g	0	50	93	75	38	48	36	57	55
26deg.	100	1876	1745	2389	887	731	777	913	1317
Wing	delta	1827	1651	2314	848	683	741	856	1263
Sweep	0	130	28	22	-153	-103	-21	129	-78
+7.33g	0	125	31	29	-142	-93	-23	122	-75
26deg.	100	-3953	-5032	-6176	-2067	-1990	-2492	-1345	-3888
Wing	delta	-4078	-5063	-6205	-1925	-1897	-2469	-1467	-3813
Sweep	0	35	106	88	31	78	44	52	41

Table B6: F111 Wing Test - Large Configuration
Zero and 100% Strain Histories

Load Case	Nominal %Load Level	Gauge ID							
		274	275	279	280	281	282	35	58
		Strain (microstrain)							
-2.4g	0	-45	-52	74	119	25	-6	61	3
56deg.	100	470	240	838	1109	930	1162	1561	641
Wing	delta	515	291	763	990	905	1168	1500	638
Sweep	0	-149	-111	-13	57	-5	-97	65	-10
+7.33g	0	-140	-113	-9	56	-44	-94	62	-9
56deg.	100	-2773	-31	-2256	-1693	-1873	-3565	-4236	-2276
Wing	delta	-2633	82	-2247	-1749	-1829	-3471	-4298	-2268
Sweep	0	-107	120	90	67	66	67	46	16
-3.0g	0	-136	120	75	69	33	65	60	15
26deg.	100	510	429	1054	1406	1129	1467	1942	867
Wing	delta	646	309	978	1336	1095	1401	1882	852
Sweep	0	-266	-55	-6	54	-37	-112	66	-14
+7.33g	0	-258	-53	4	50	-32	-109	69	-10
26deg.	100	-2839	59	-2275	-1709	-1887	-3584	-4257	-2326
Wing	delta	-2582	112	-2279	-1759	-1855	-3475	-4326	-2316
Sweep	0	-138	127	100	65	66	59	51	19

Load Case	Nominal %Load Level	Gauge ID							
		91-1	91-2	91-3	92-1	92-2	92-3	96-1	96-2
		Strain (microstrain)							
-2.4g	0	30	20	-13	35	11	-14	53	11
56deg.	100	1154	460	-410	1195	358	-459	1506	268
Wing	delta	1124	441	-396	1160	347	-446	1453	256
Sweep	0	16	8	-16	27	16	-18	47	3
+7.33g	0	15	7	-14	26	15	-17	45	3
56deg.	100	-4221	-423	2353	-4212	-1853	2231	-4119	-407
Wing	delta	-4235	-430	2367	-4239	-1868	2248	-4164	-410
Sweep	0	44	37	-9	33	-9	-9	50	15
-3.0g	0	51	43	-14	48	-4	-11	58	17
26deg.	100	1464	552	-513	1541	435	-587	1882	315
Wing	delta	1412	509	-500	1493	438	-576	1824	298
Sweep	0	22	20	-17	25	11	-15	46	2
+7.33g	0	24	21	-18	32	9	-15	50	4
26deg.	100	-4292	-427	2421	-4212	-1920	2243	-4143	-403
Wing	delta	-4316	-448	2439	-4244	-1929	2259	-4193	-407
Sweep	0	48	44	-10	48	-11	-8	55	19

Table B6: F111 Wing Test - Large Configuration
Zero and 100% Strain Histories

Load Case	Nominal %Load Level	Gauge ID							
		96-3	97-1	97-2	97-3	25-1	25-2	25-3	26-1
		Strain (microstrain)							
-2.4g	0	-18	53	-1	-18	-13	82	-21	-4
56deg.	100	-555	1510	333	-453	-328	1784	127	102
Wing	delta	-537	1457	335	-435	-314	1702	148	106
Sweep	0	-20	48	-16	-29	-10	44	-28	11
+7.33g	0	-19	46	-22	-28	*	*	*	*
56deg.	100	1966	-4014	-837	1632	*	*	*	*
Wing	delta	1985	-4061	-816	1659	*	*	*	*
Sweep	0	-9	53	9	-3	*	*	*	*
-3.0g	0	-15	60	5	-8	-19	104	14	3
26deg.	100	-686	1873	403	-564	-416	2176	162	142
Wing	delta	-671	1813	398	-555	-396	2072	148	139
Sweep	0	-21	45	-25	-29	-11	37	-27	10
+7.33g	0	-19	49	-20	-26	-14	44	-24	8
26deg.	100	1994	-4029	-835	1657	497	-4571	-841	74
Wing	delta	2013	-4078	-815	1683	511	-4615	-818	66
Sweep	0	-7	57	12	-1	-21	107	18	2

Load Case	Nominal %Load Level	Gauge ID							
		26-2	26-3	278-1	278-2	278-3	27-1	27-2	27-3
		Strain (microstrain)							
-2.4g	0	73	28	-9	74	-17	-12	76	-22
56deg.	100	1590	164	124	1483	-718	-162	1386	-588
Wing	delta	1516	135	133	1409	-702	-150	1310	-566
Sweep	0	47	33	-28	56	20	-16	9	-37
+7.33g	0	*	*	*	*	*	*	*	*
56deg.	100	*	*	*	*	*	*	*	*
Wing	delta	*	*	*	*	*	*	*	*
Sweep	0	*	*	*	*	*	*	*	*
-3.0g	0	85	1	16	91	-46	-1	82	-34
26deg.	100	1955	211	146	1801	-905	-213	1707	-744
Wing	delta	1870	209	129	1710	-859	-211	1625	-710
Sweep	0	43	34	-29	59	22	-11	3	-42
+7.33g	0	48	30	-26	66	15	-9	12	-48
26deg.	100	-3660	-175	-881	-3951	1505	-659	-3820	1208
Wing	delta	-3708	-205	-856	-4016	1490	-650	-3832	1256
Sweep	0	89	-1	16	94	-47	0	85	-32

Table B6: F111 Wing Test - Large Configuration
Zero and 100% Strain Histories

Load Case	Nominal %Load Level	Gauge ID							
		264-1	264-2	264-3	265-1	265-2	265-3	266-1	266-2
		Strain (microstrain)							
-2.4g	0	-62	28	-24	29	61	-4	-10	64
56deg.	100	167	1829	61	-260	1290	-256	-399	1510
Wing	delta	230	1801	84	-288	1228	-252	-389	1446
Sweep	0	-108	-51	-33	67	42	22	10	45
+7.33g	0	*	*	*	*	*	*	*	*
56deg.	100	*	*	*	*	*	*	*	*
Wing	delta	*	*	*	*	*	*	*	*
Sweep	0	*	*	*	*	*	*	*	*
-3.0g	0	17	107	0	-19	75	-17	-25	83
26deg.	100	247	2266	90	-346	1571	-325	-486	1857
Wing	delta	230	2158	90	-327	1497	-308	-461	1774
Sweep	0	-108	-60	-37	68	38	21	14	47
+7.33g	0	-101	-48	-38	62	43	19	9	56
26deg.	100	-562	-4335	73	711	-3086	585	958	-3617
Wing	delta	-460	-4287	111	649	-3130	566	949	-3673
Sweep	0	22	113	-1	-21	78	-17	-23	88

Load Case	Nominal %Load Level	Gauge ID							
		266-3	267-1	267-2	267-3	268	269	270	271
		Strain (microstrain)							
-2.4g	0	-10	-20	50	-8	-27	-55	-16	2
56deg.	100	3	-297	1140	-67	-686	-961	-489	-261
Wing	delta	14	-277	1091	-59	-658	-905	-473	-262
Sweep	0	9	-21	10	-7	-57	-127	20	3
+7.33g	0	*	-25	13	-6	-53	-113	20	-9
56deg.	100	*	1001	-2425	-610	1459	1442	965	1343
Wing	delta	*	1025	-2438	-604	1512	1555	945	1352
Sweep	0	*	-13	64	-5	-30	-12	-31	-6
-3.0g	0	-4	-20	69	-5	-43	-44	-38	-19
26deg.	100	23	-357	1421	-81	-858	-1218	-611	-326
Wing	delta	27	-336	1352	-75	-814	-1174	-573	-307
Sweep	0	12	-30	7	-3	-49	-138	24	-1
+7.33g	0	11	-35	15	-2	-50	-130	17	-18
26deg.	100	83	1022	-2453	-608	1486	1469	982	1377
Wing	delta	72	1056	-2467	-606	1536	1599	965	1395
Sweep	0	-7	-16	66	-5	-33	-18	-34	-7

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Appendix C:

Plots of Strain Data from the Tests

Selected plots of the test data are presented in this appendix. Two types of plot are presented.

The first type of plot is the history of strain versus load for a single gauge element over the full CPLT cycle of one round of testing. These are referred to as 'strain history plots'.

The second type of plot is the strain versus location for a collection of contiguous gauges. Data at 0% and 100% load for a number of load cases are typically shown together on the one plot. These are referred to as 'strain distribution plots'.

It should be noted that load shown in both types of plots is the nominal percentage load level of the increment rather than the actual load readings. This was done for simplicity and is justified by the close agreement between the measured and nominal loads.

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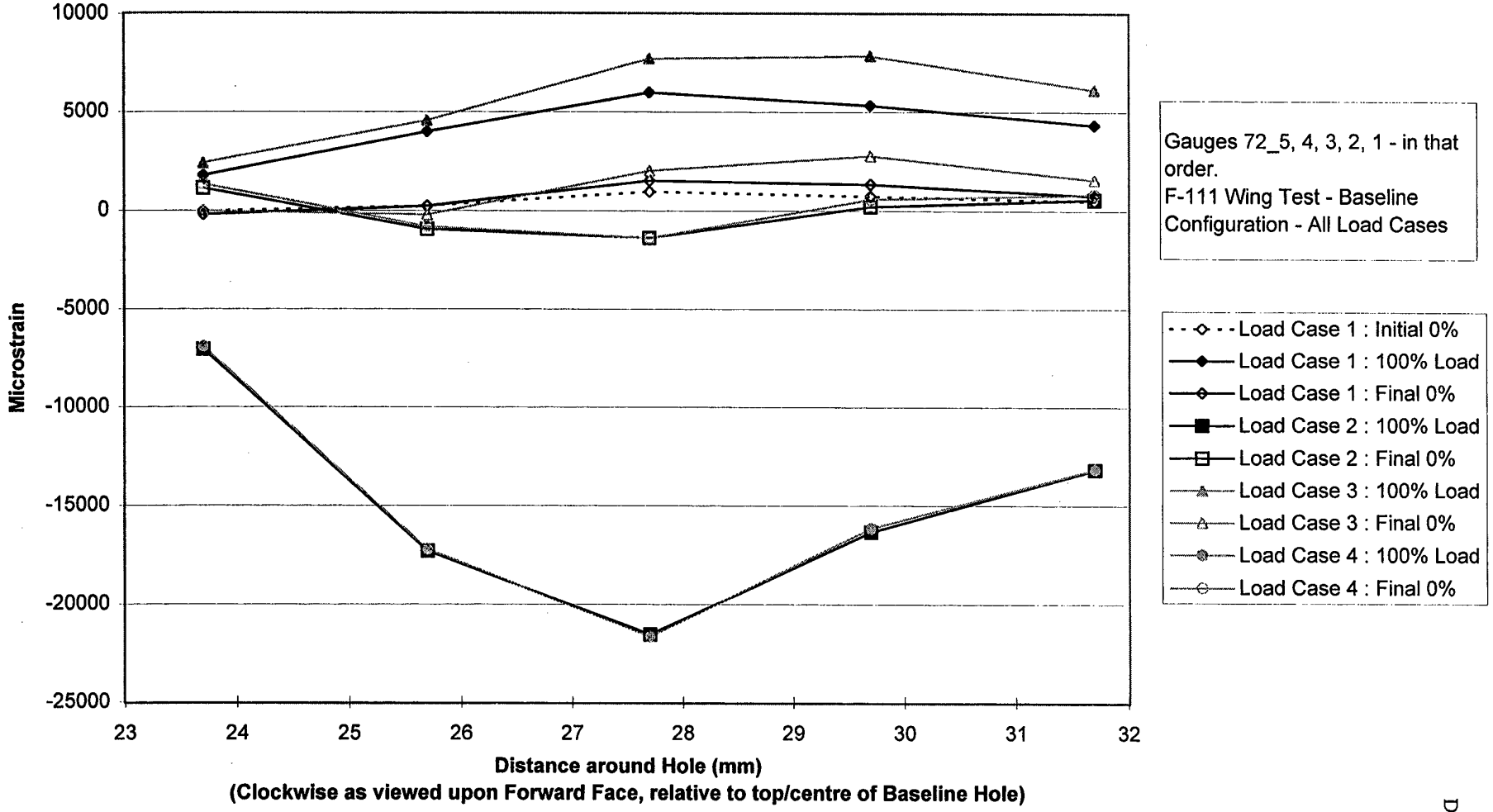

Figure C1 : Peak and Zero Strain Distribution Around FFVH#13 Lower Inboard Corner

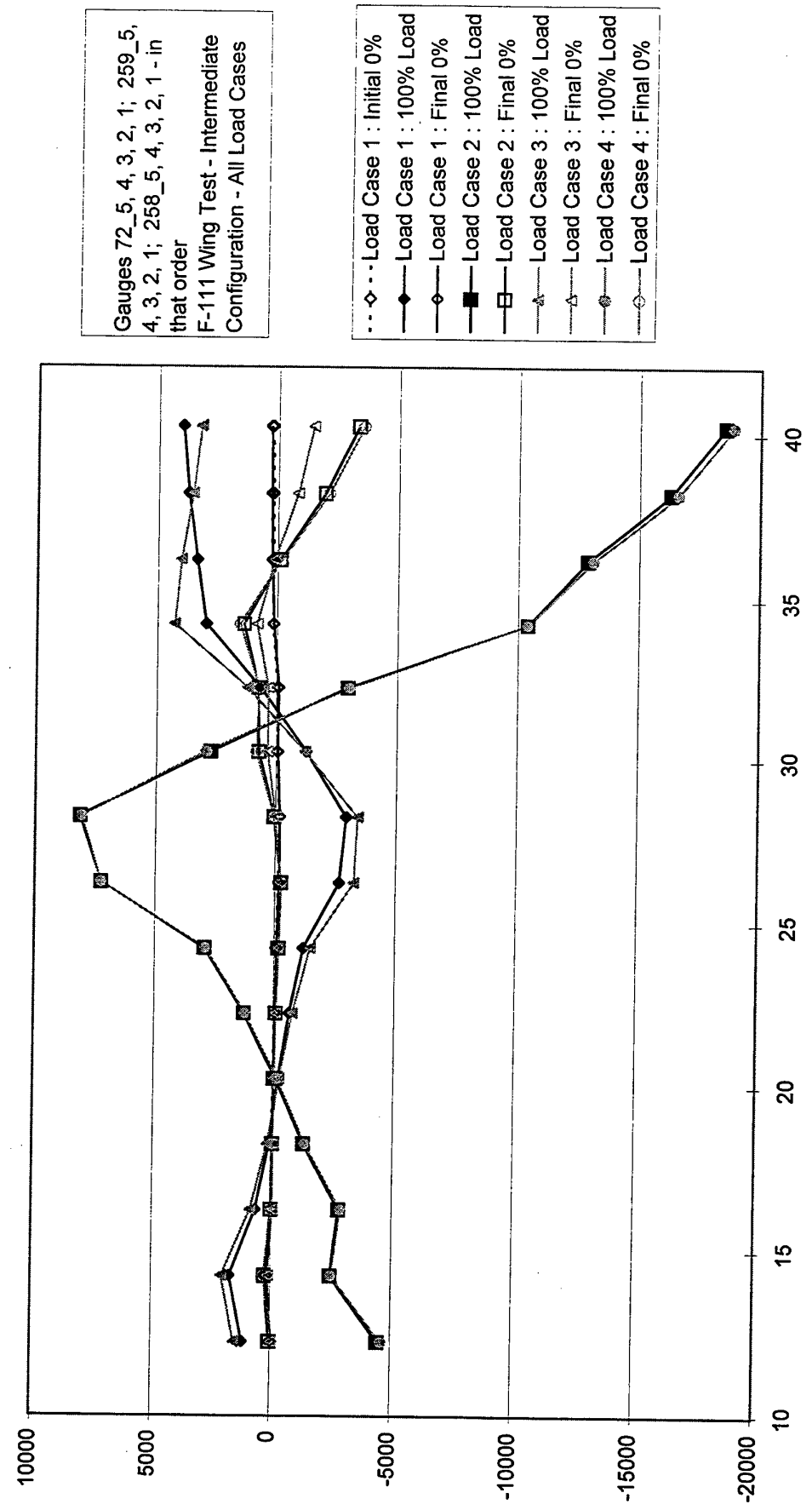

Figure C2 : Peak and Zero Strain Distribution Around FFVH#13 Lower Inboard Corner

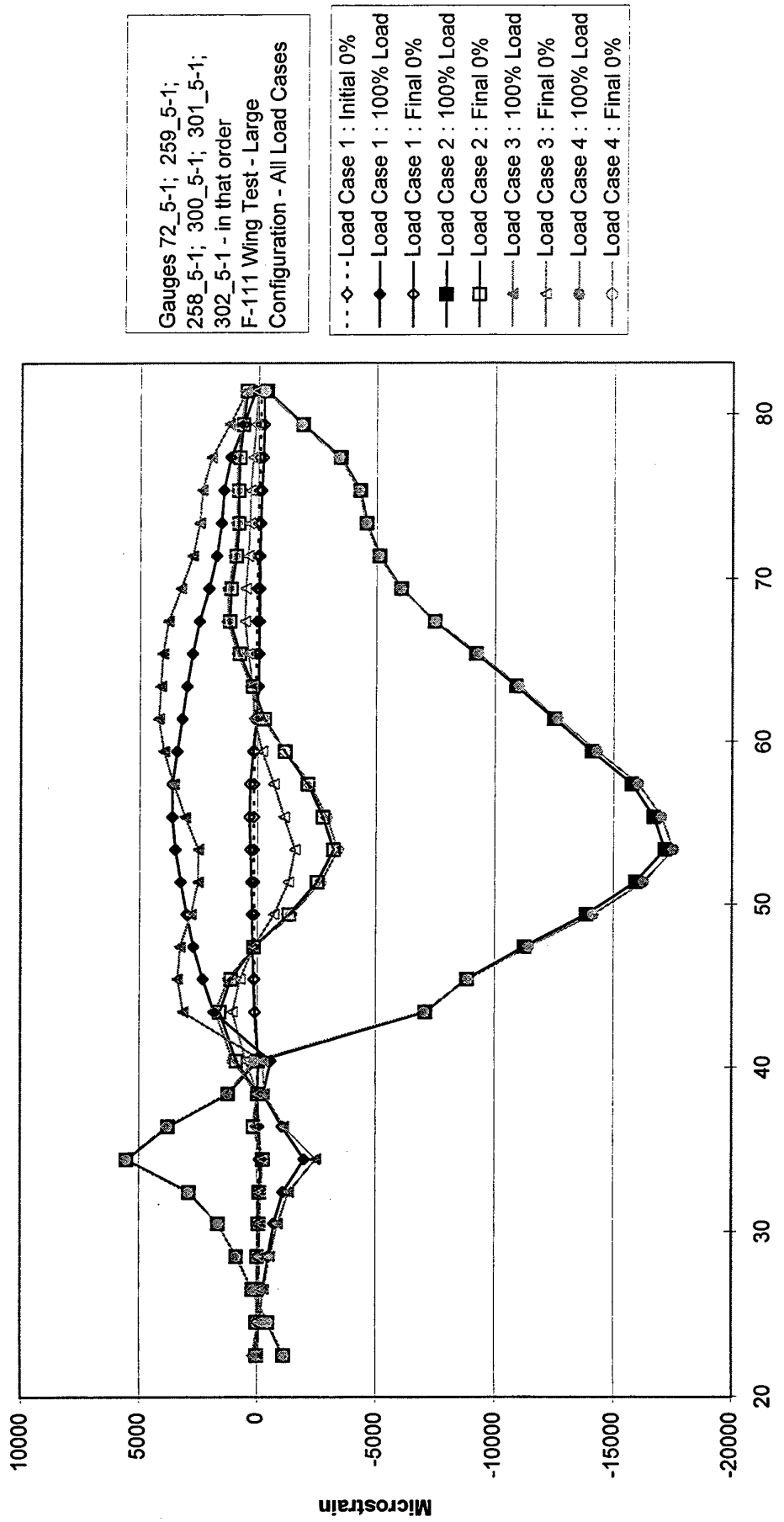

Figure C3 : Peak and Zero Strain Distribution Around FFVH#13 Lower Inboard Corner

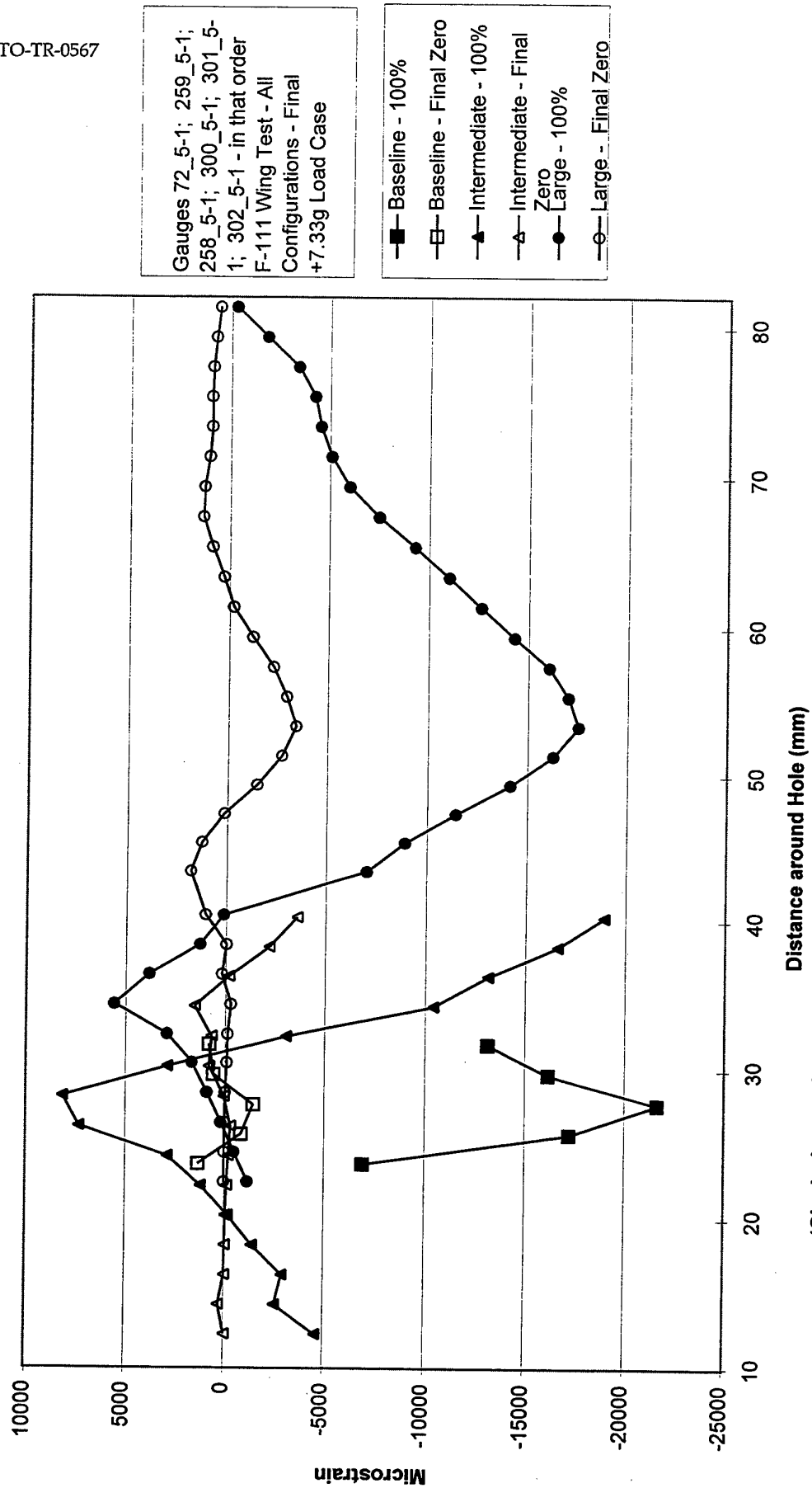

Figure C4 : Peak and Zero Strain Distribution Around FFVH#13 Lower Inboard Corner

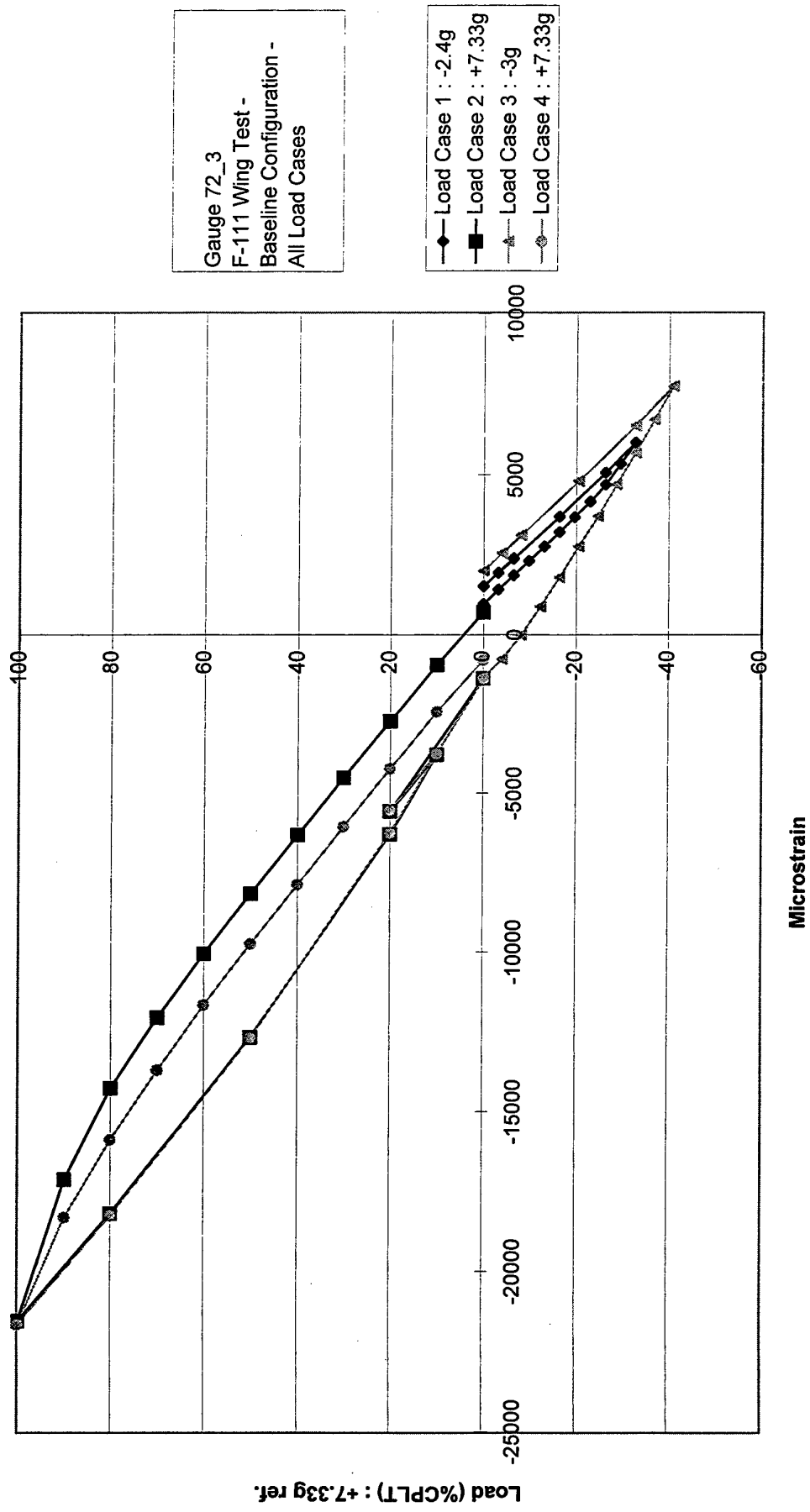

Figure C5 : Strain History For Maximum Strain Gauge In FFVH#13 Lower Inboard Corner

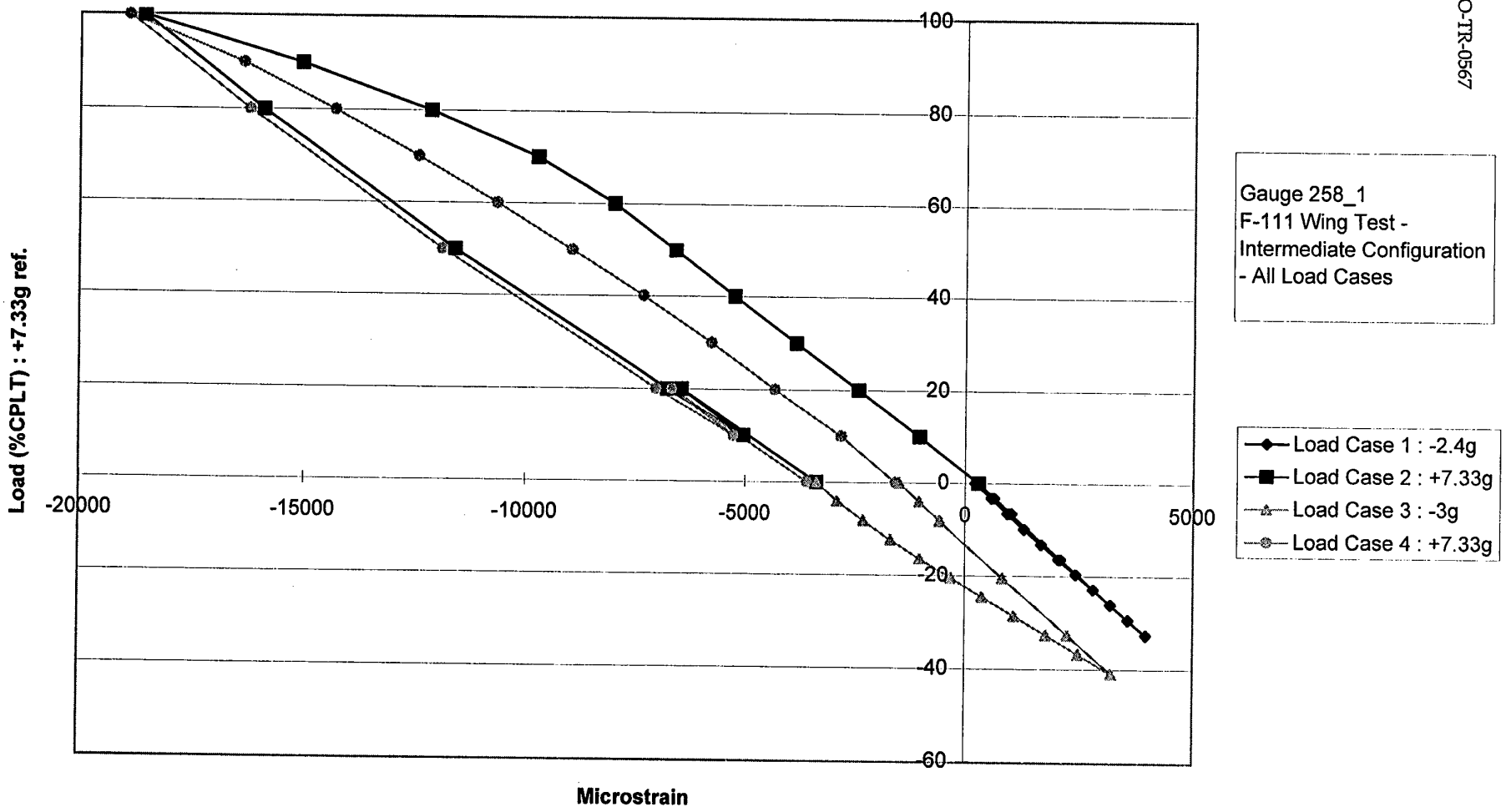

Figure C6 : Strain History For Maximum Strain Gauge In FFVH#13 Lower Inboard Corner

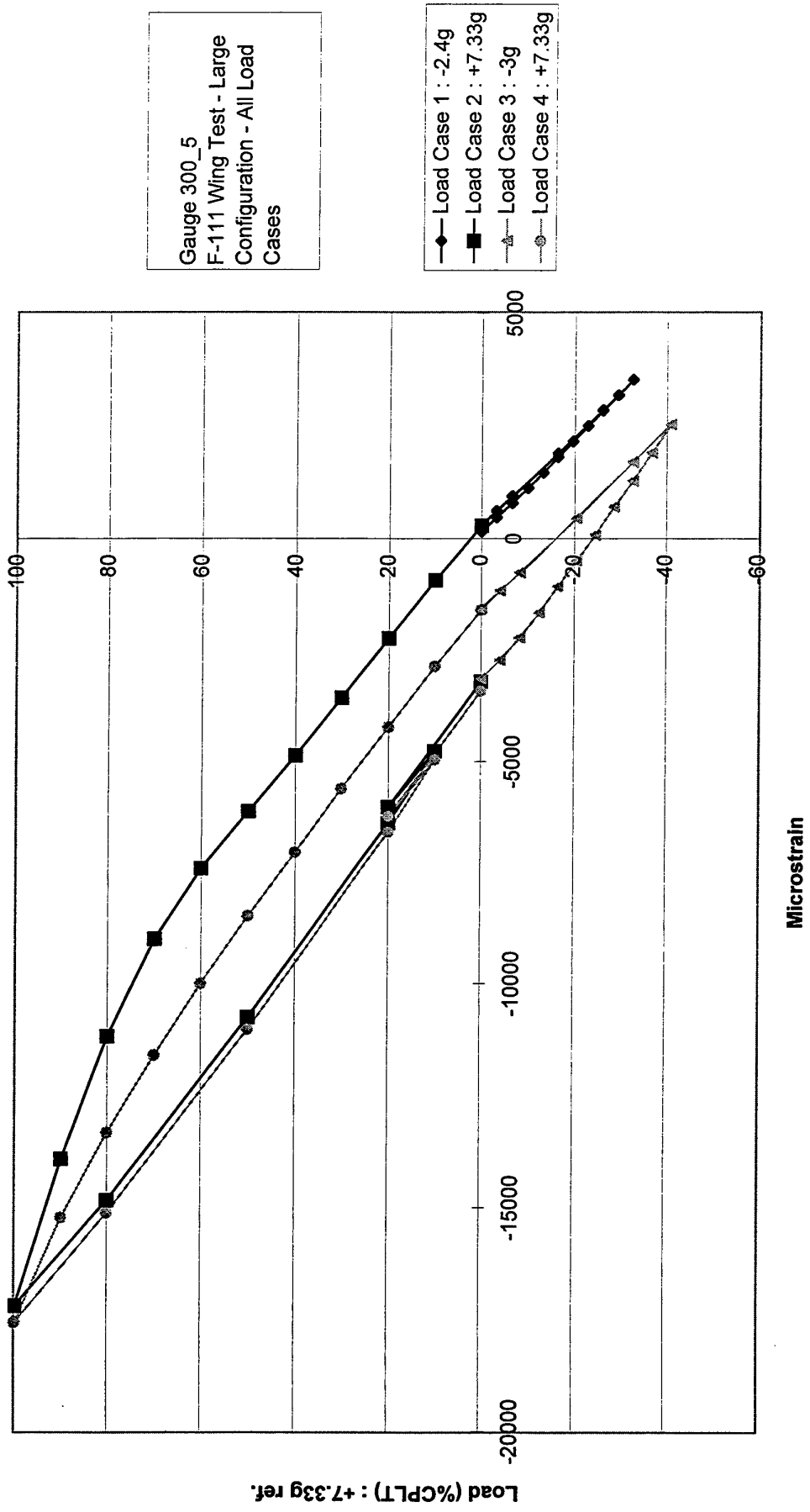

Figure C7 : Strain History For Maximum Strain Gauge In FFVH#13 Lower Inboard Corner

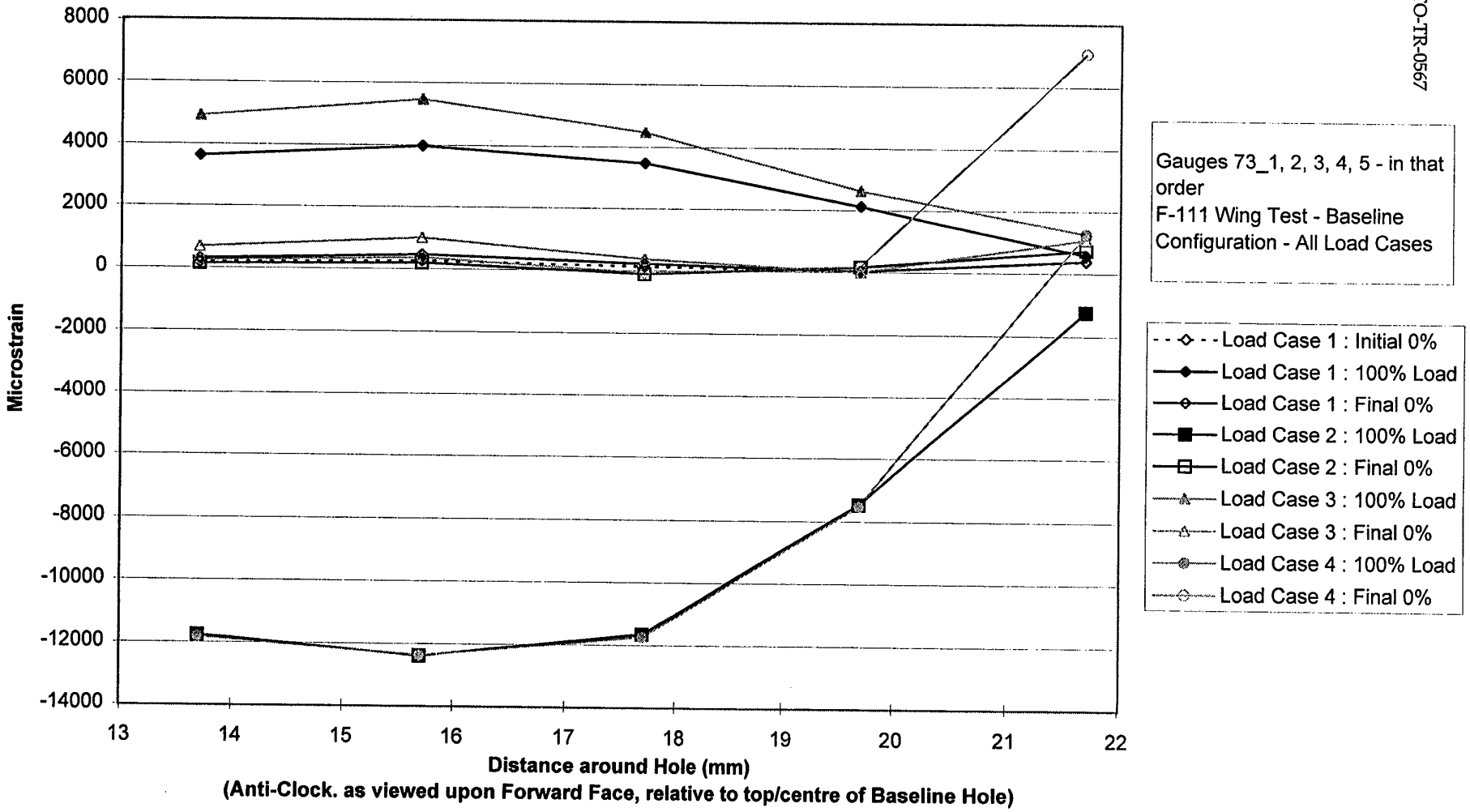

Figure C8 : Peak and Zero Strain Distribution Around FFVH#13 Upper Outboard Corner

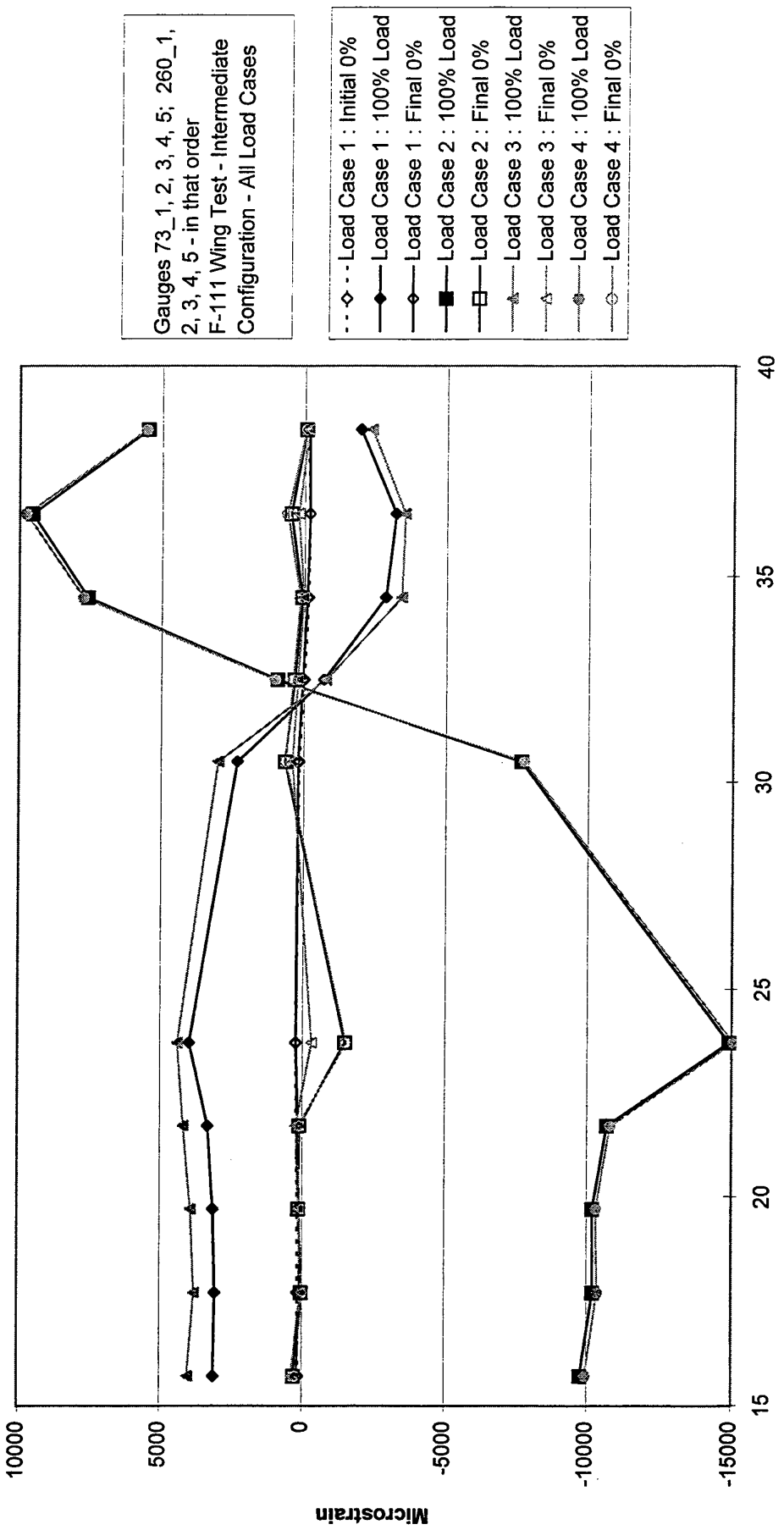

Figure C9 : Peak and Zero Strain Distribution Around FFVH#13 Upper Outboard Corner

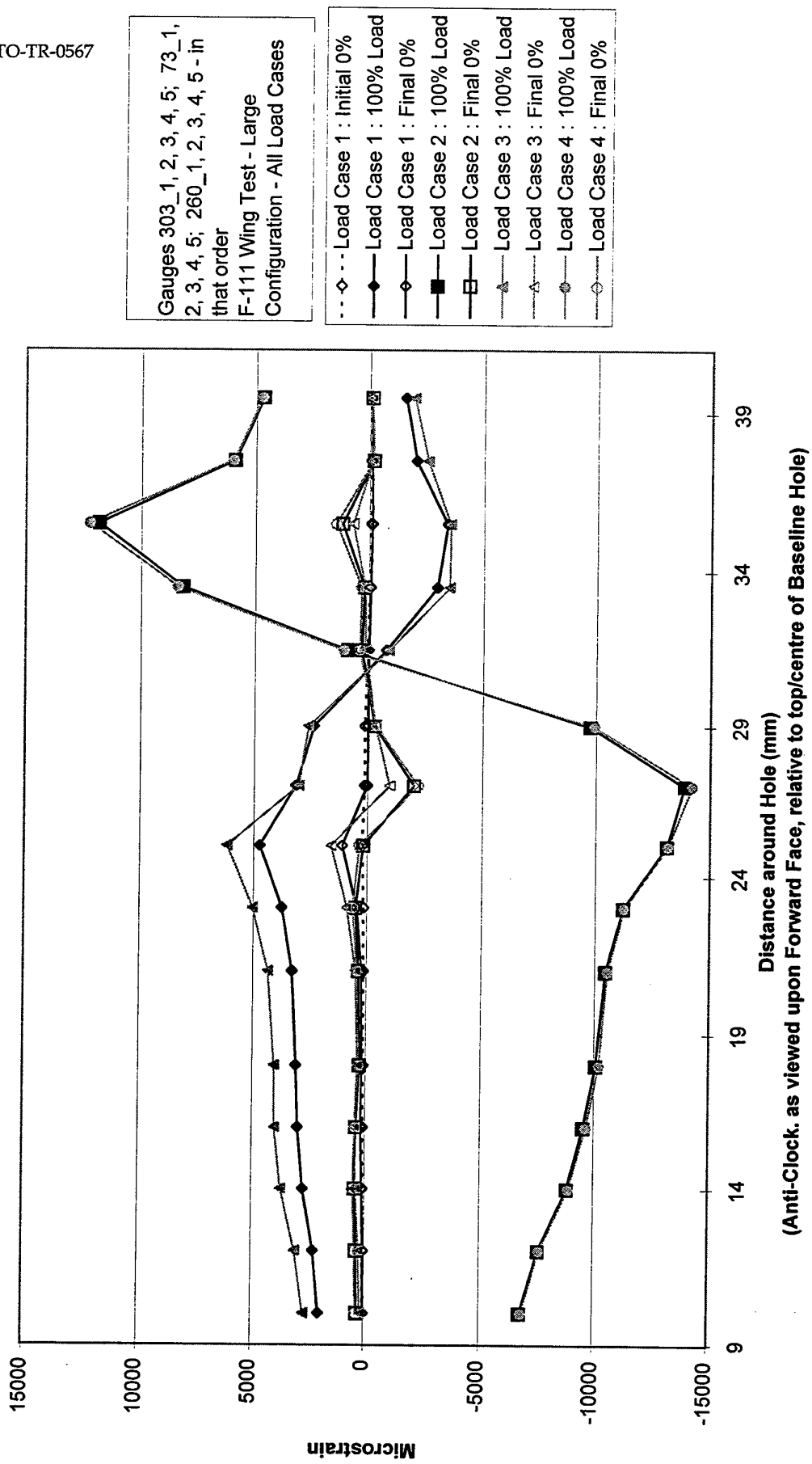

Figure C10 : Peak and Zero Strain Distribution Around FFVH#13 Upper Outboard Corner

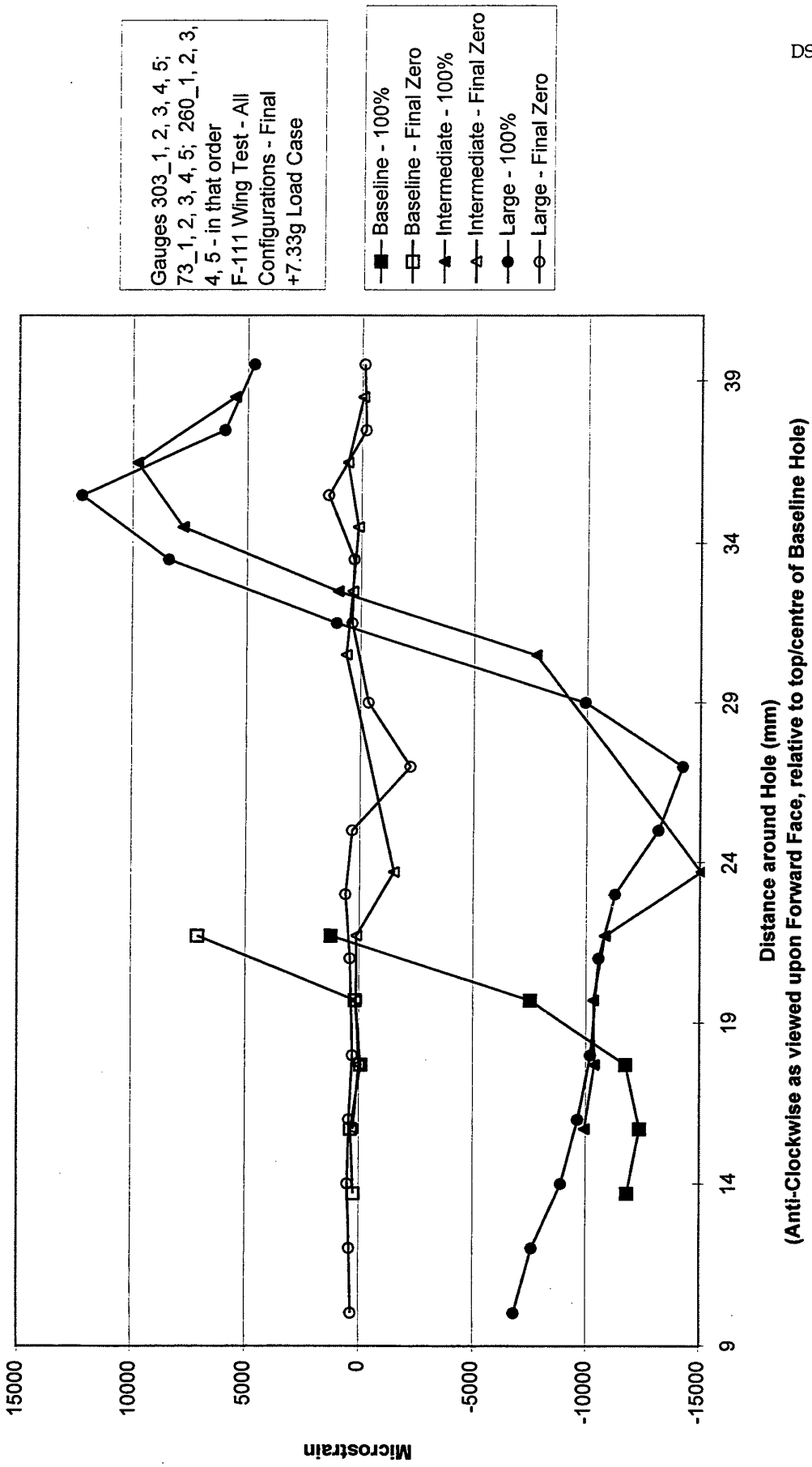

Figure C11 : Peak and Zero Strain Distribution Around FFVH#13 Upper Outboard Corner

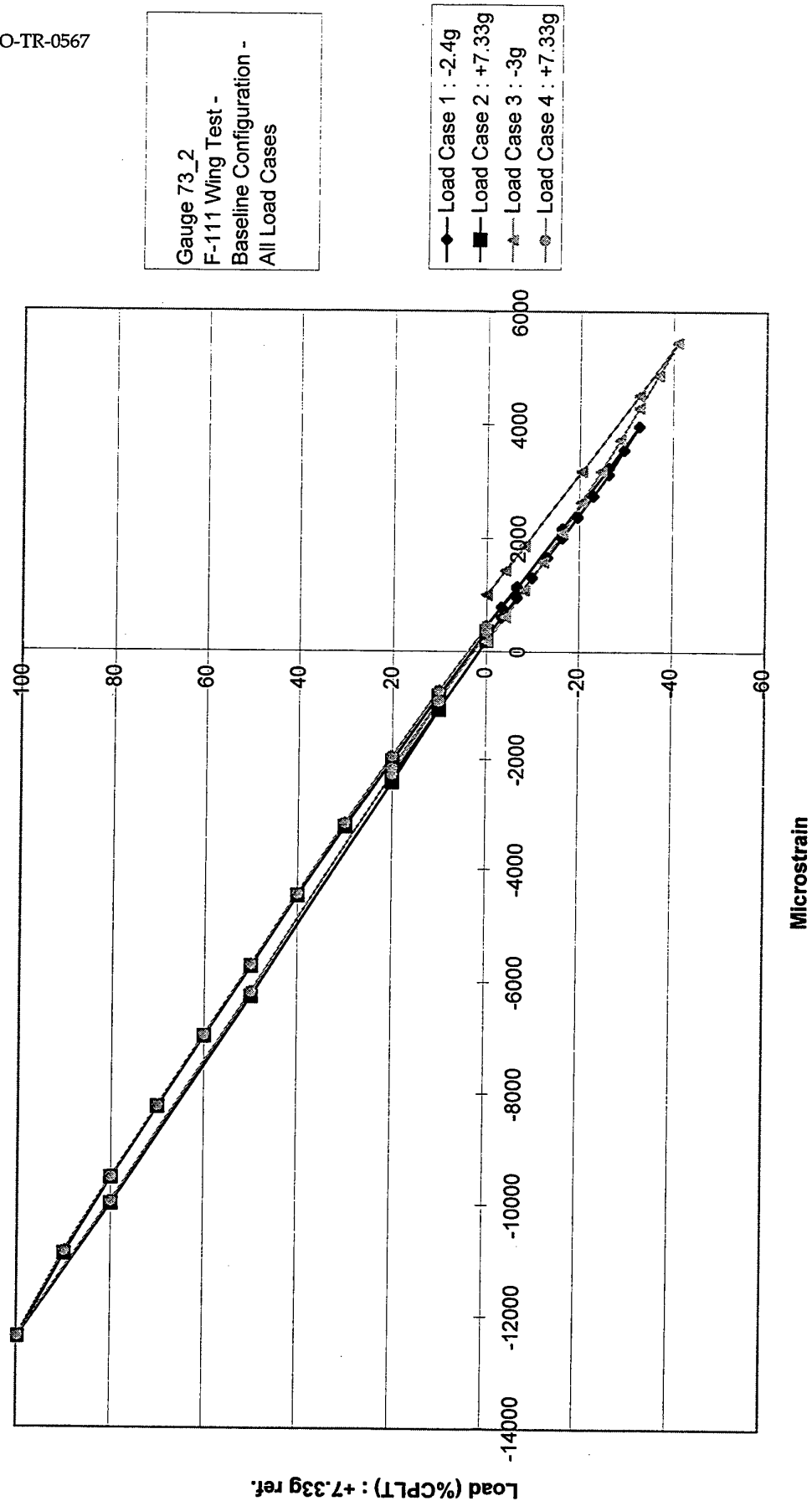

Figure C12 : Strain History For Maximum Strain Gauge In FFVH#13 Upper Outboard Corner

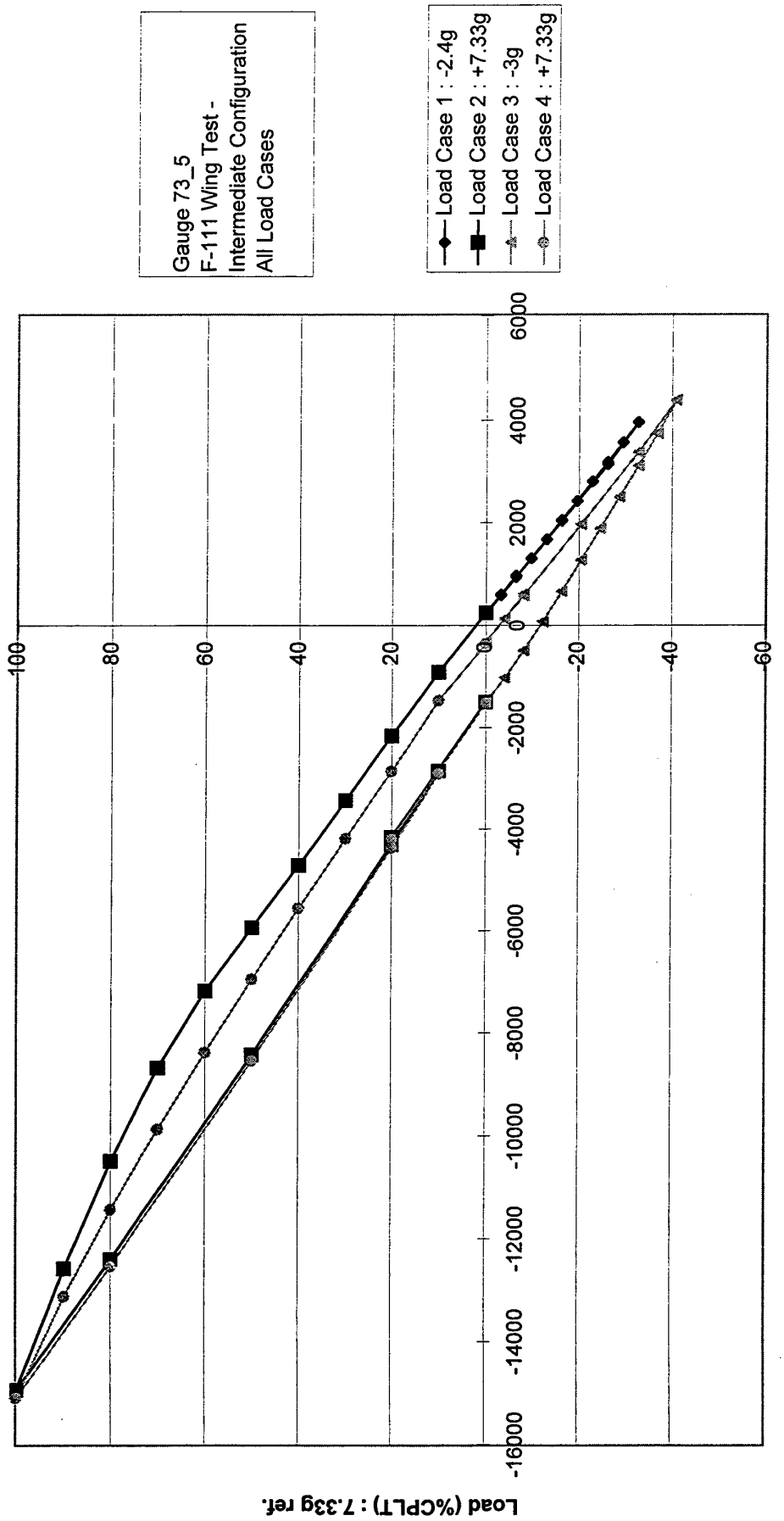

Figure C13 : Strain History For Maximum Strain Gauge In FFVH#13 Upper Outboard Corner

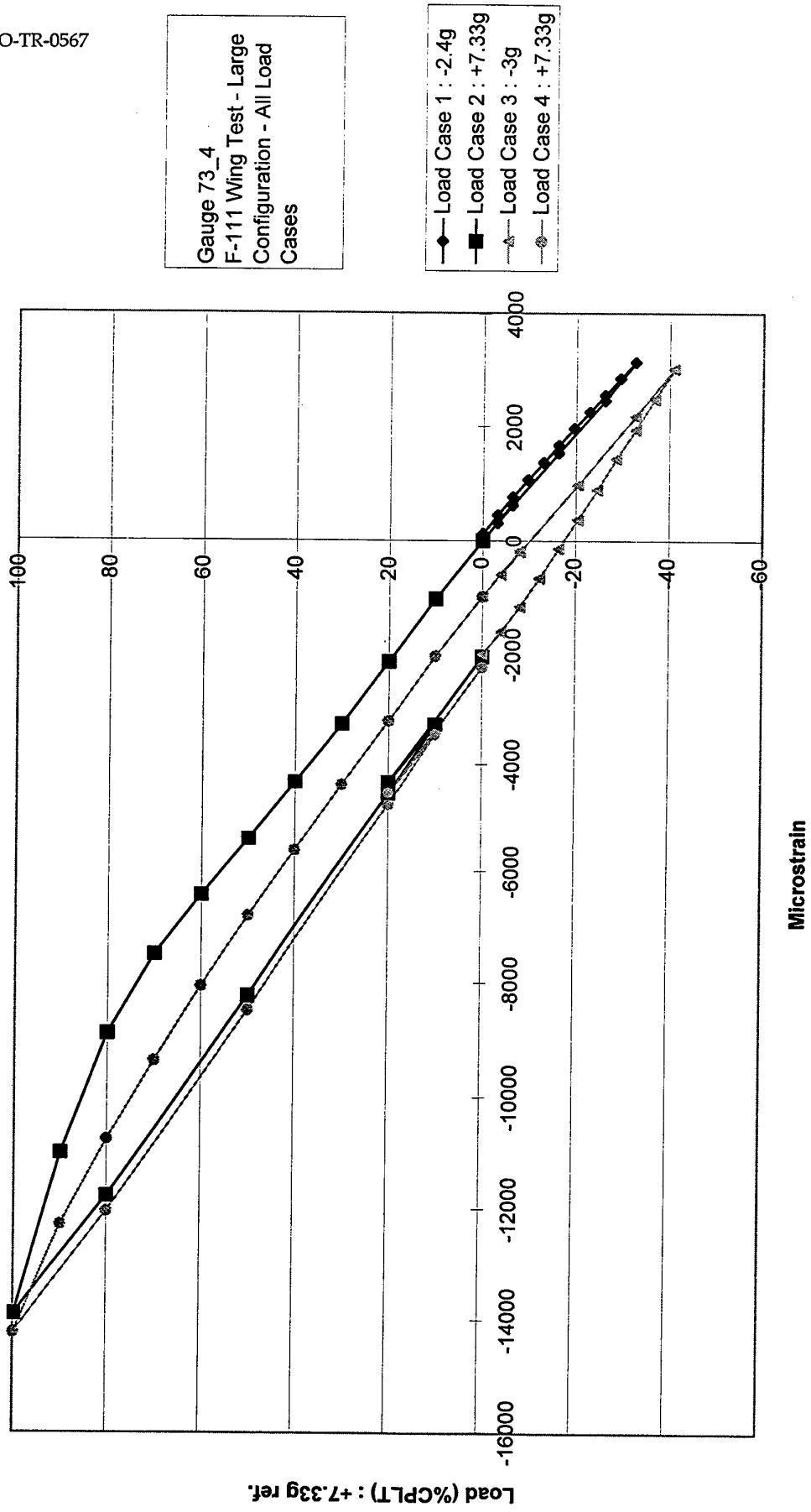

Figure C14 : Strain History For Maximum Strain Gauge In FFVH#13 Upper Outboard Corner

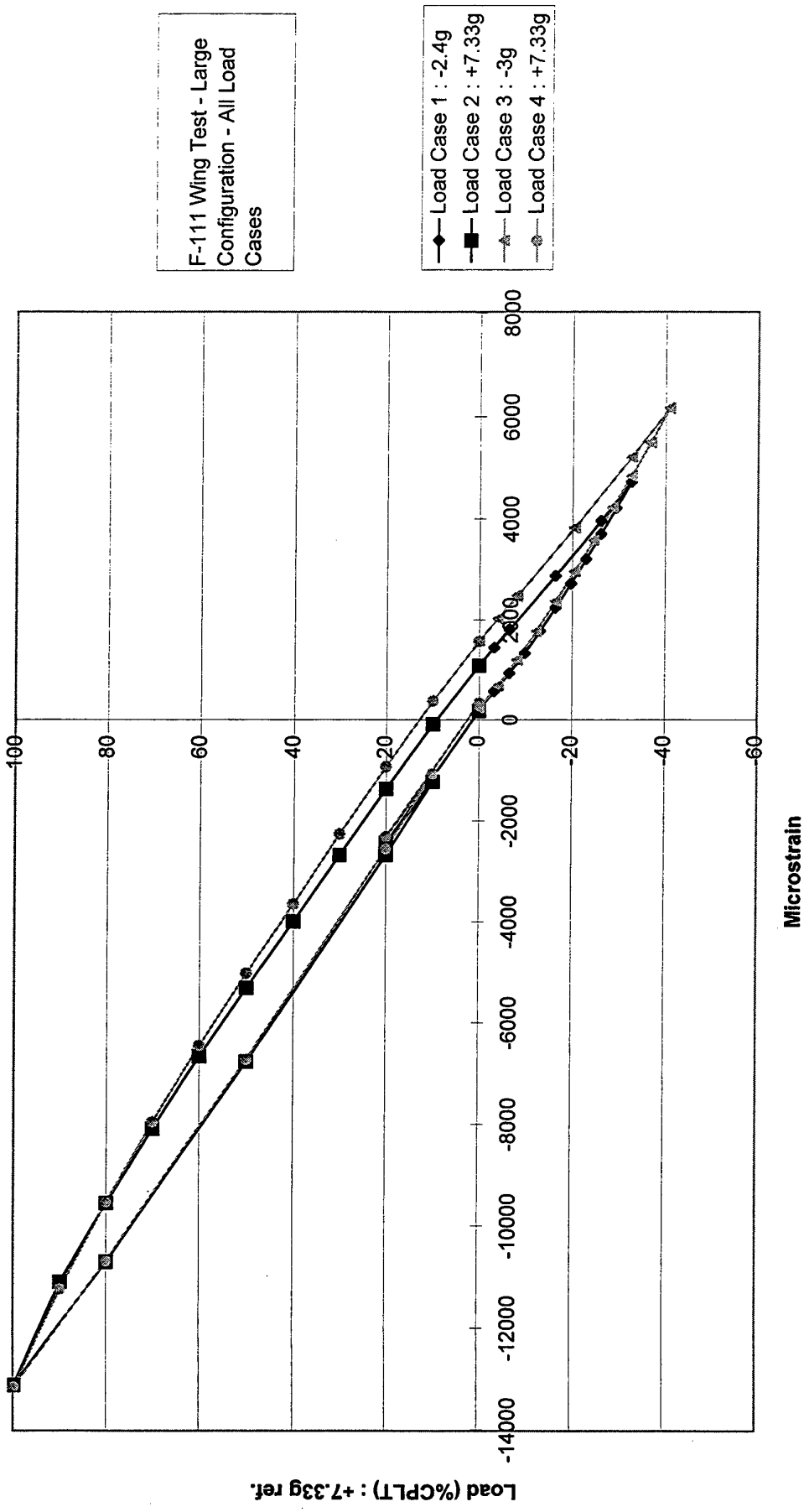

Figure C15 : Strain History For Guage 73_3 In FFVH#13 Upper Outboard Corner

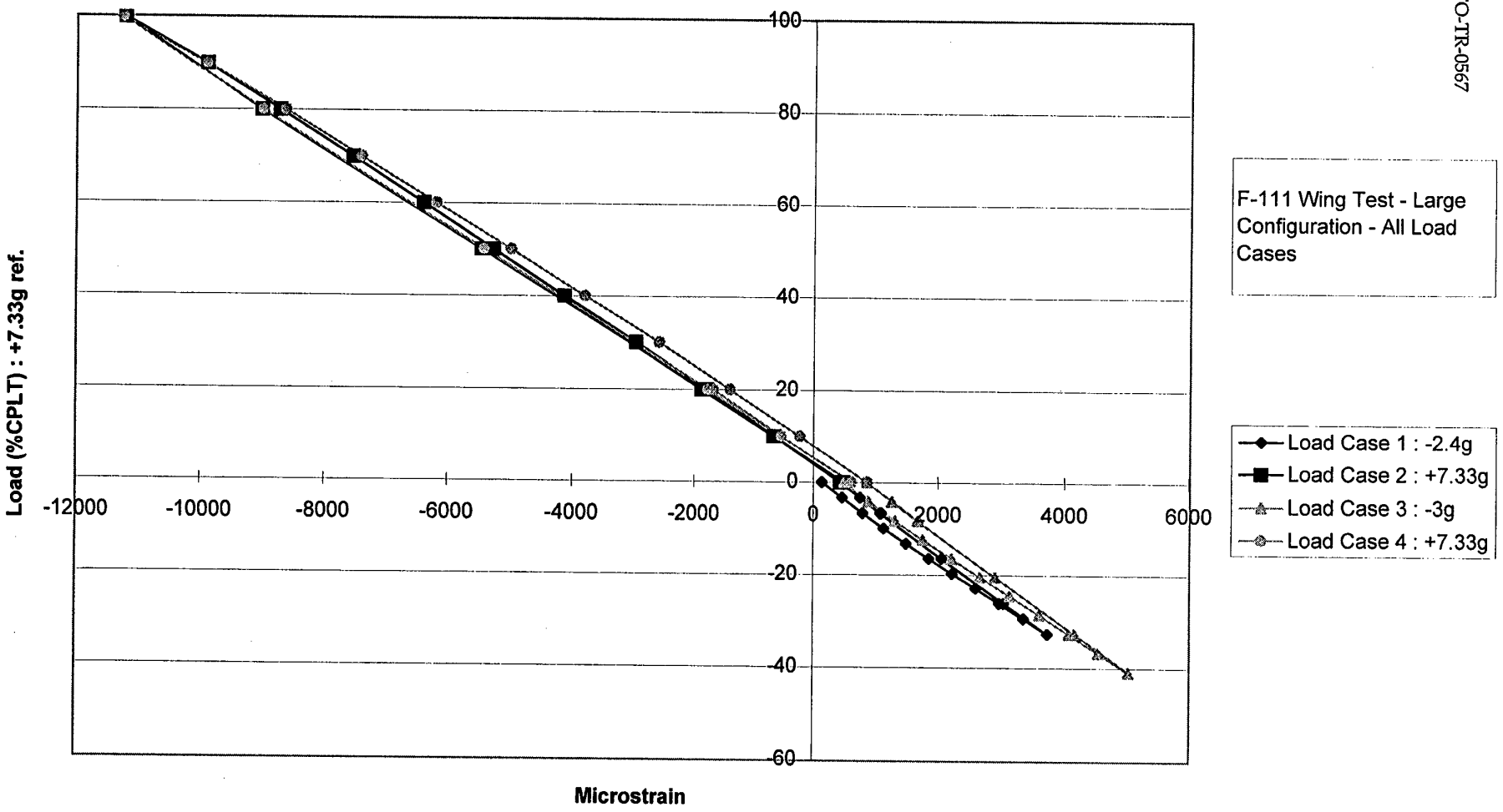

Figure C16 : Strain History For Guage 73_2 In FFVH#13 Upper Outboard Corner

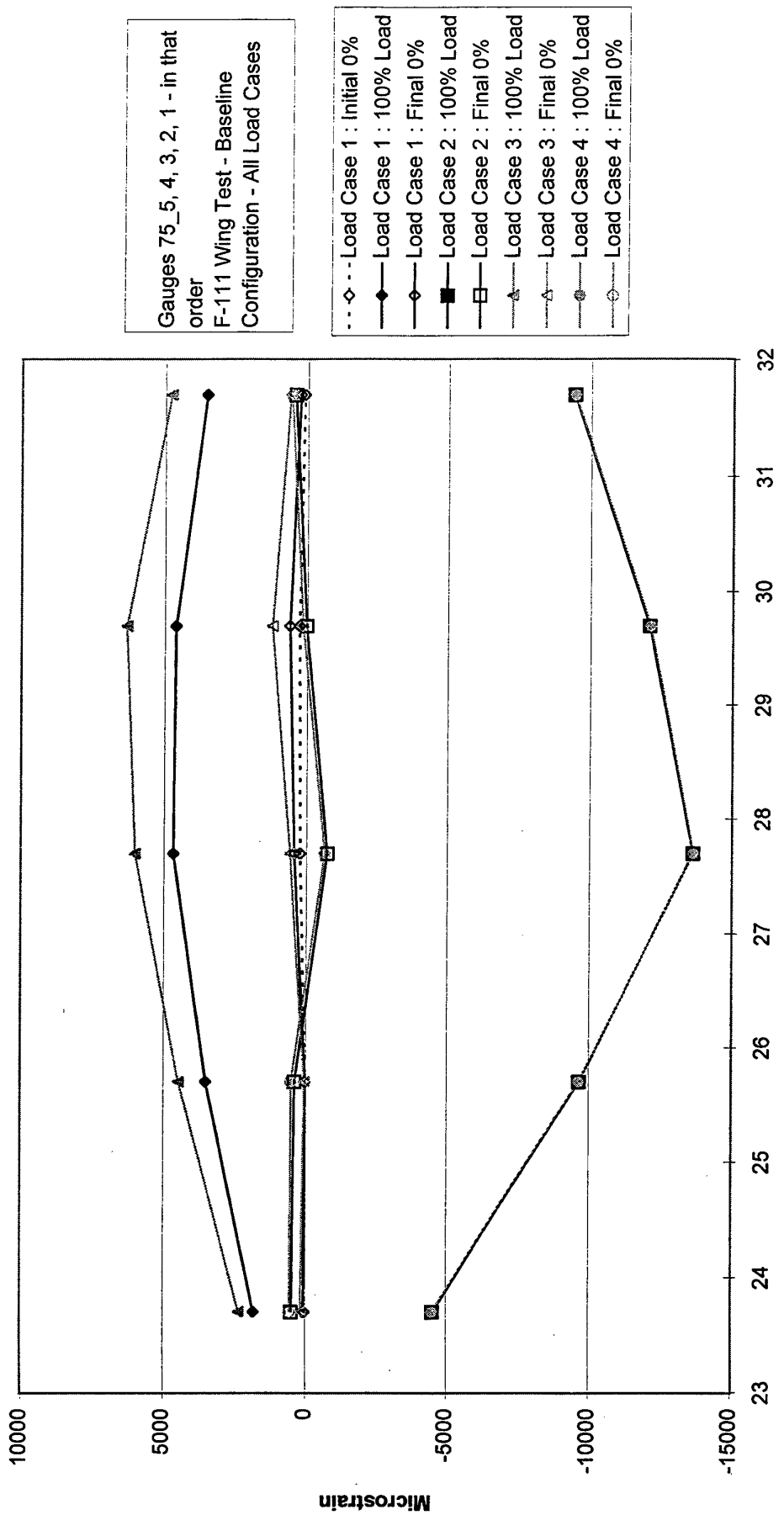

Figure C17 : Peak and Zero Strain Distribution Around FFVH#14 Lower Inboard Corner

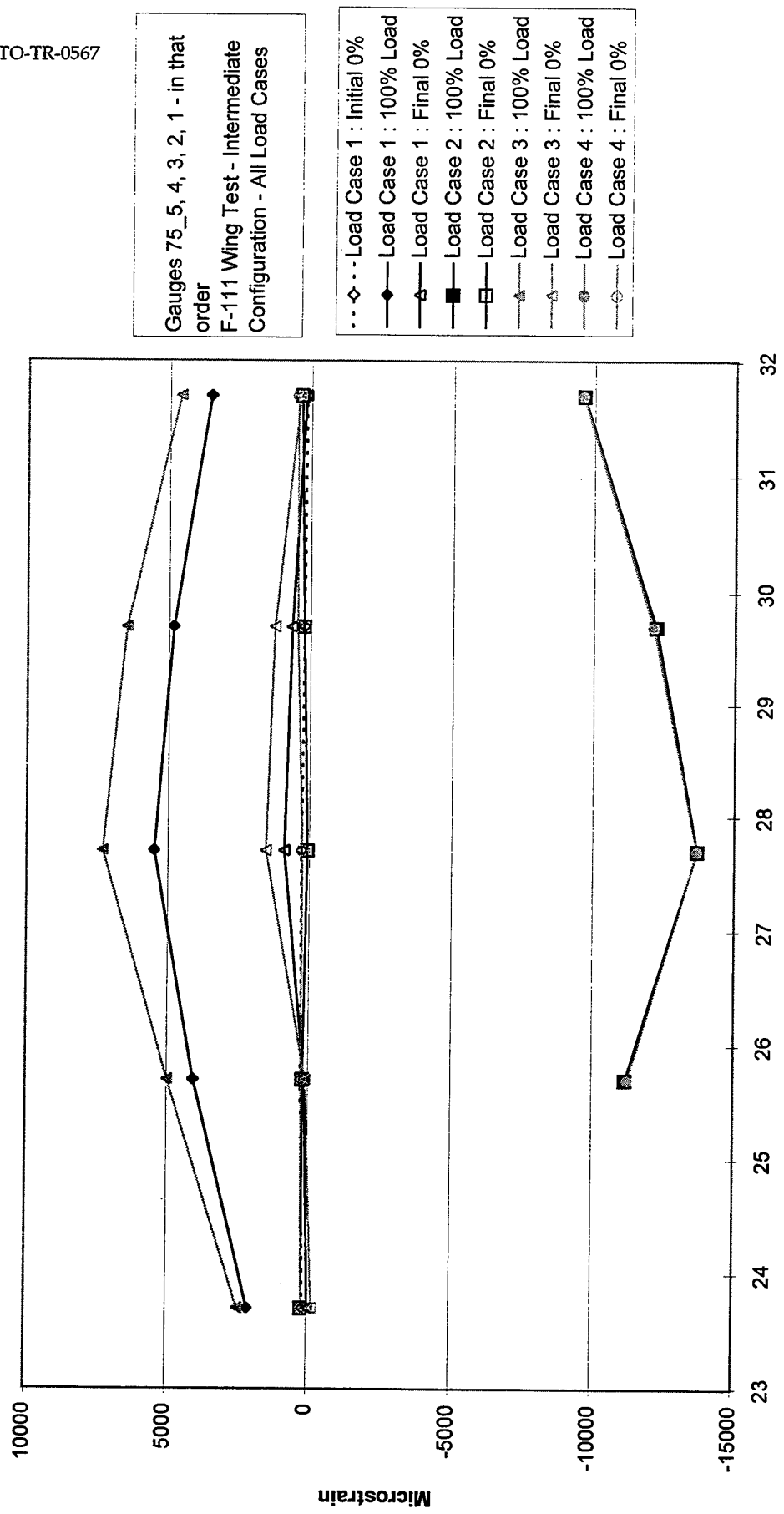

Figure C18 : Peak and Zero Strain Distribution Around FFVH#14 Lower Inboard Corner

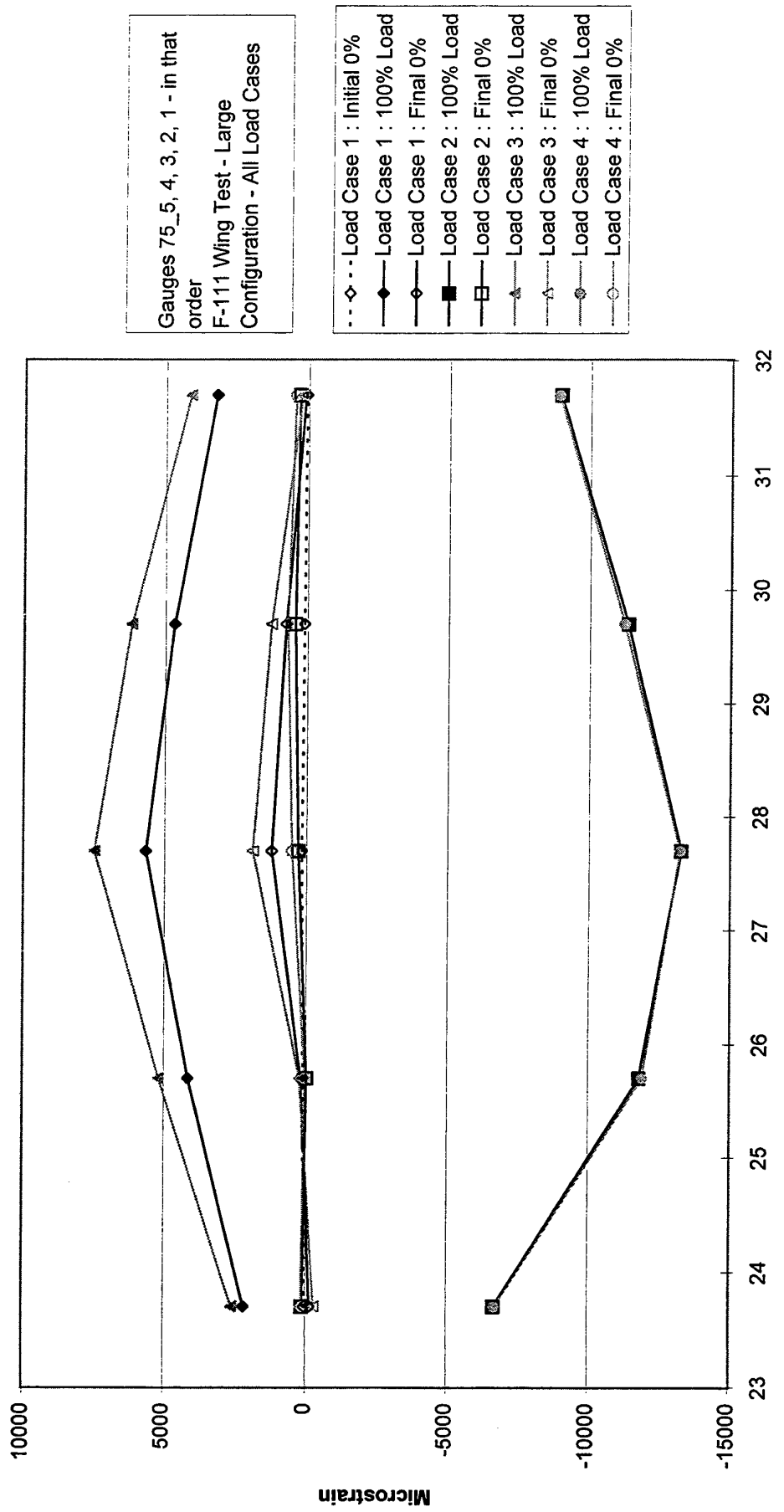

Figure C19 : Peak and Zero Strain Distribution Around FFVH#14 Lower Inboard Corner

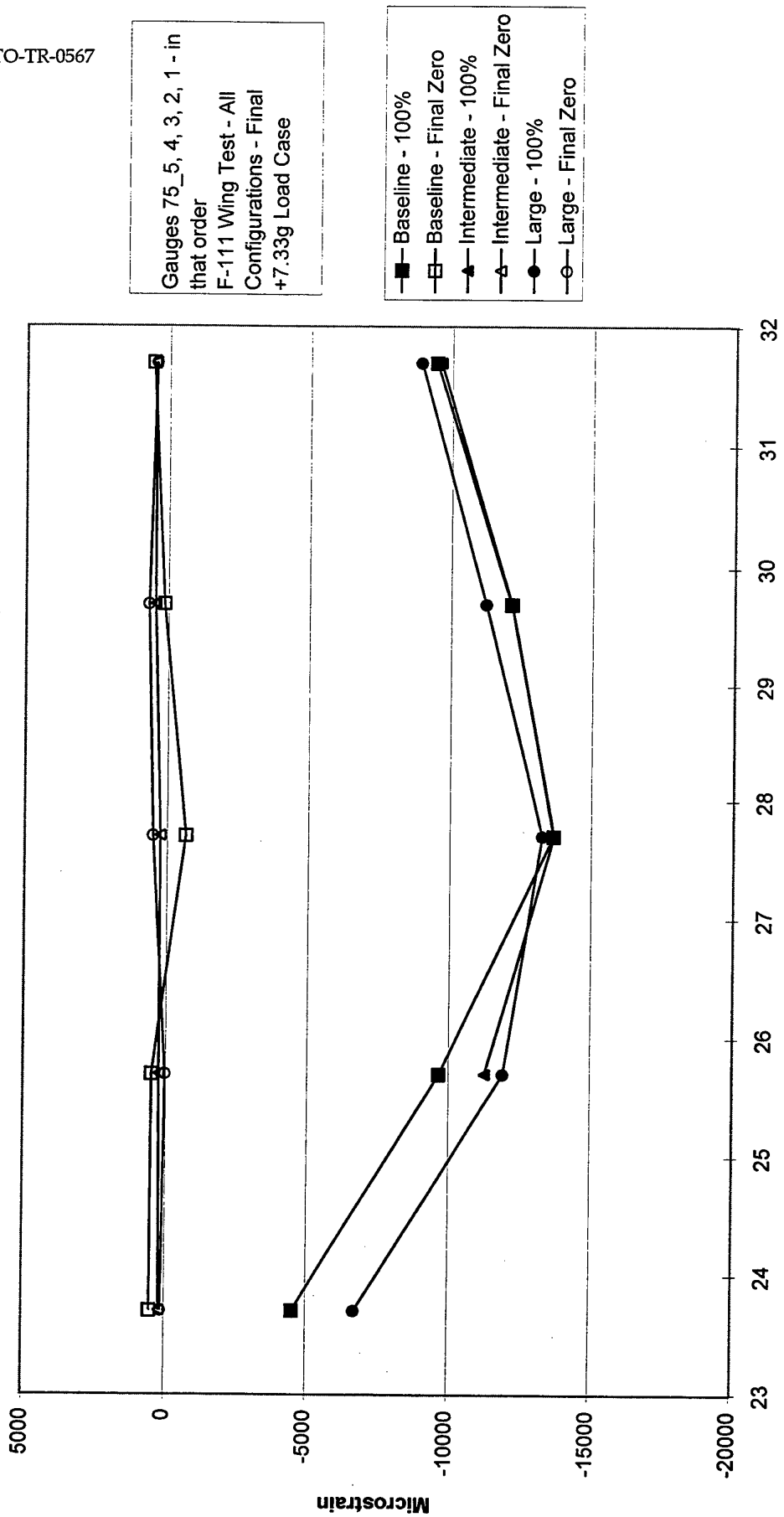

Figure C20 : Peak and Zero Strain Distribution Around FFVH#14 Lower Inboard Corner

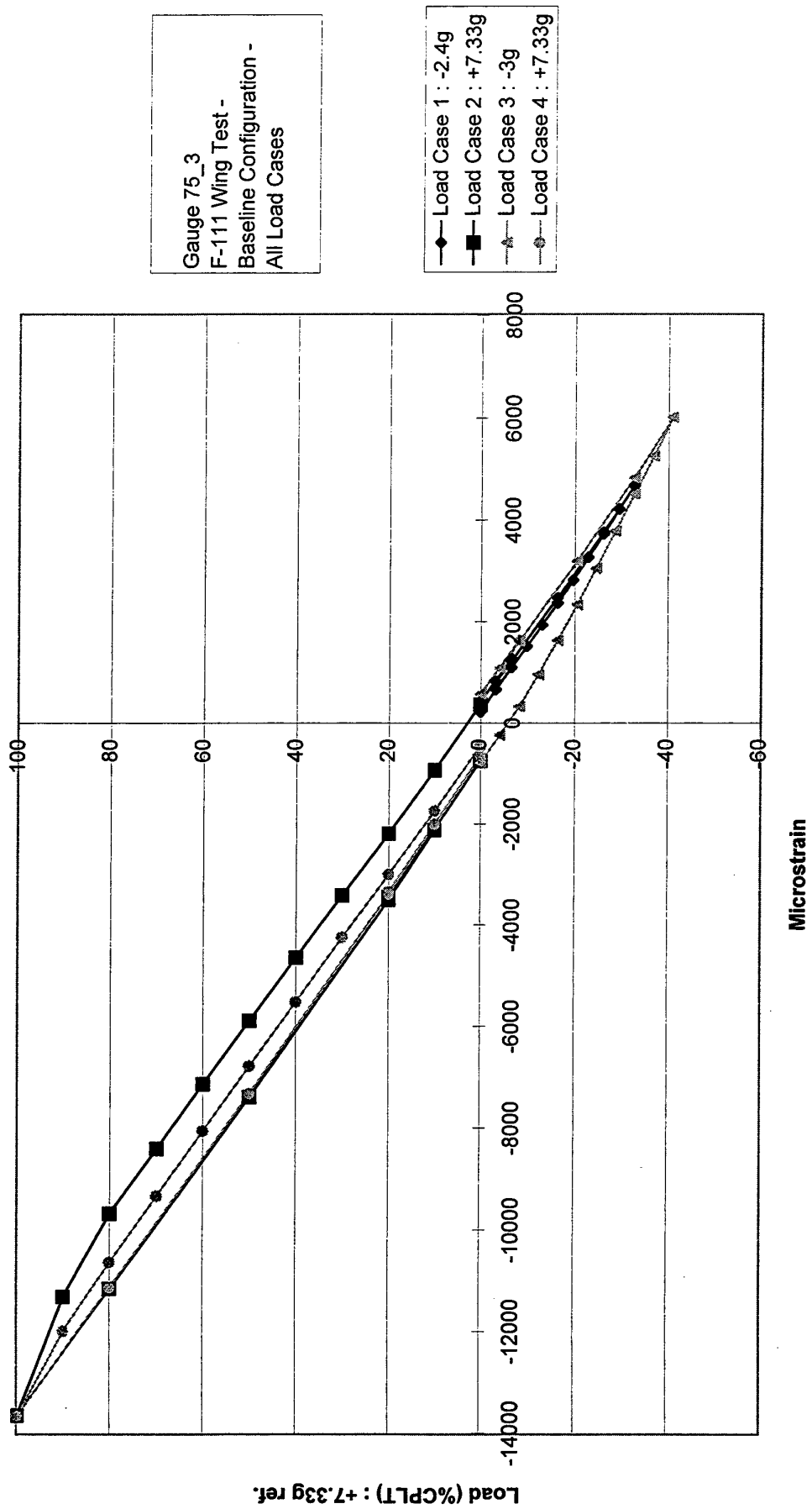

Figure C21 : Strain History For Maximum Strain Gauge In FFVH#14 Lower Inboard Corner

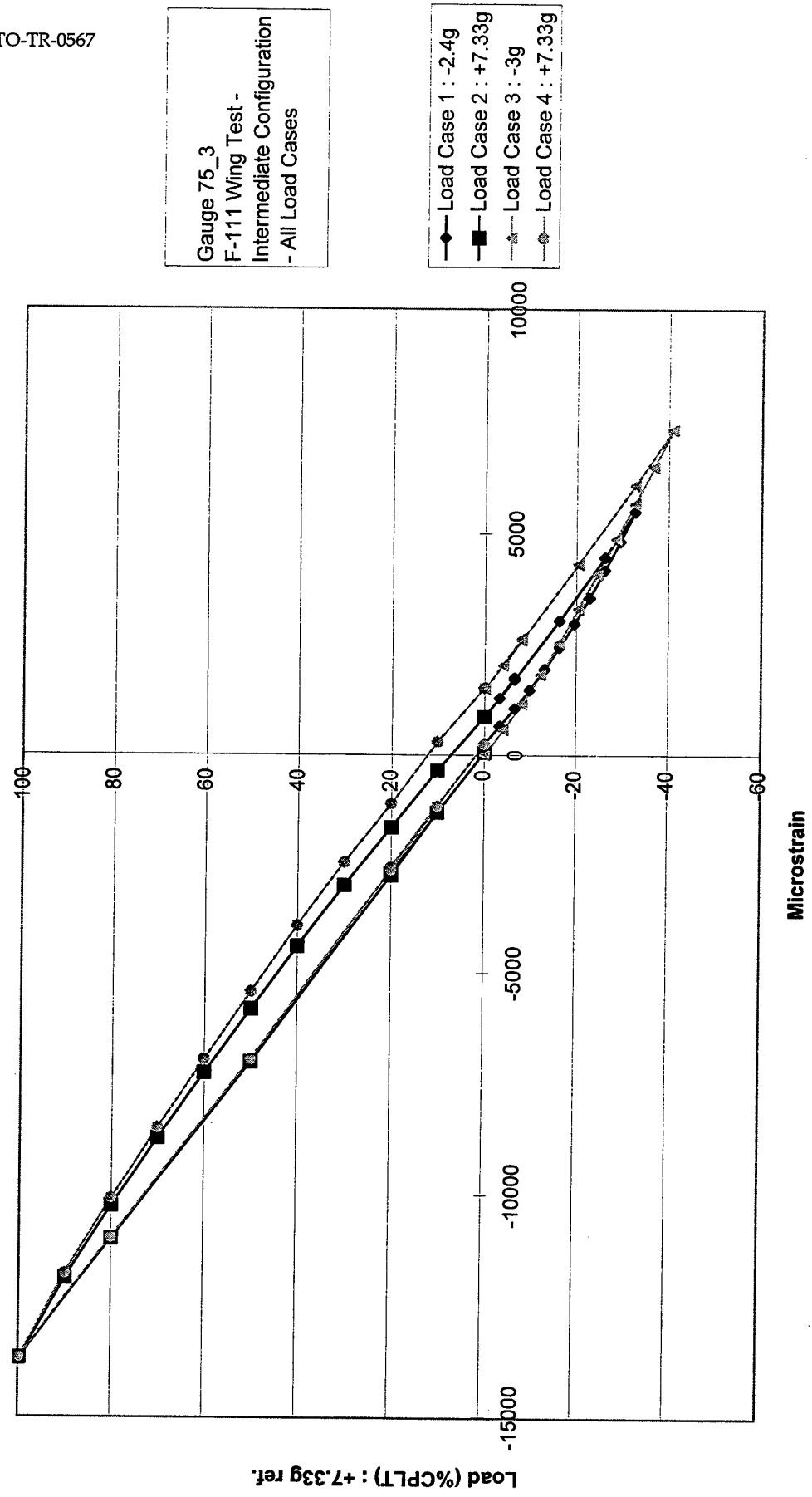

Figure C22 : Strain History For Maximum Strain Gauge In FFVH#14 Lower Inboard Corner

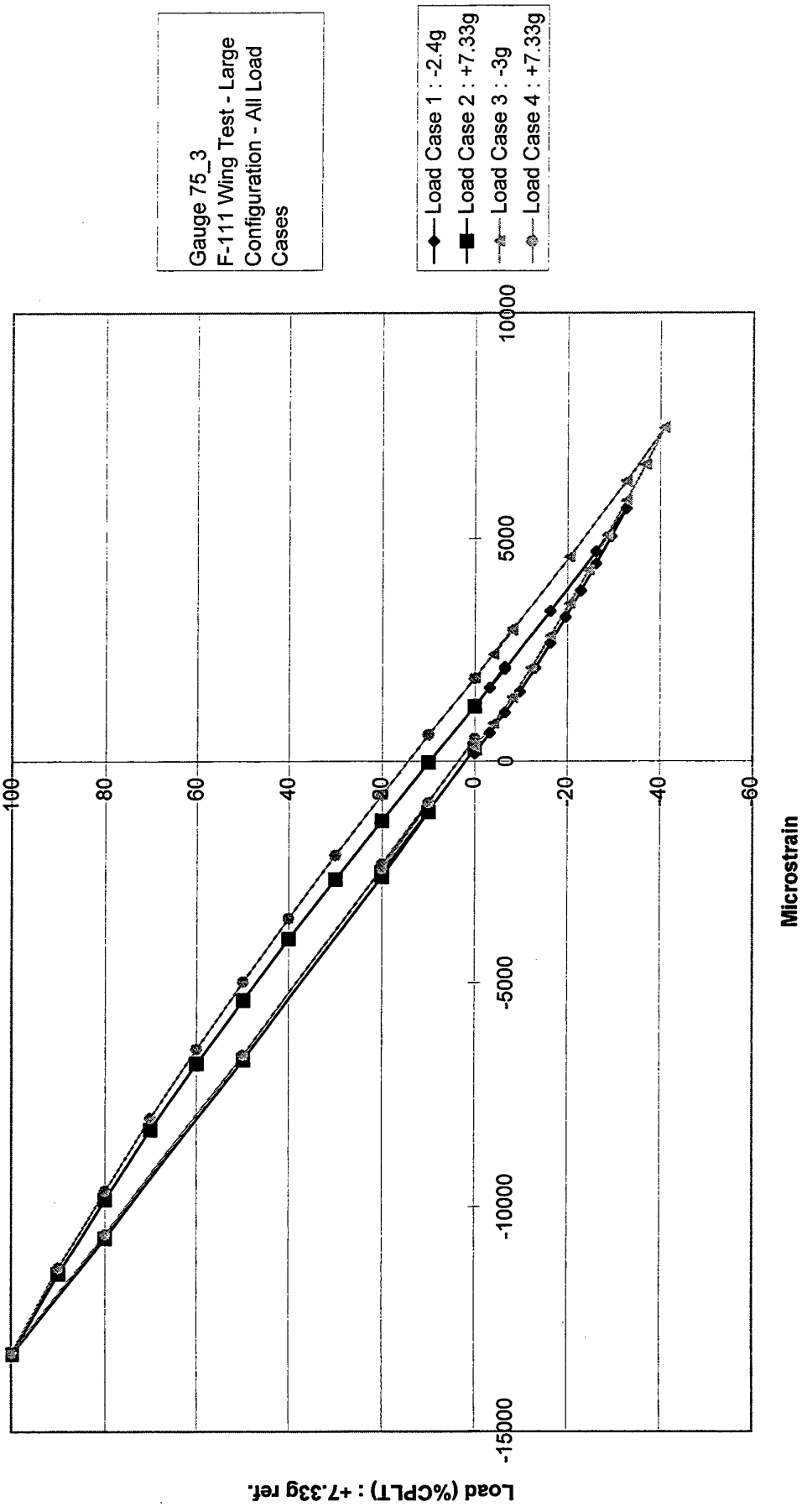

Figure C23 : Strain History For Maximum Strain Gauge In FFVH#14 Lower Inboard Corner

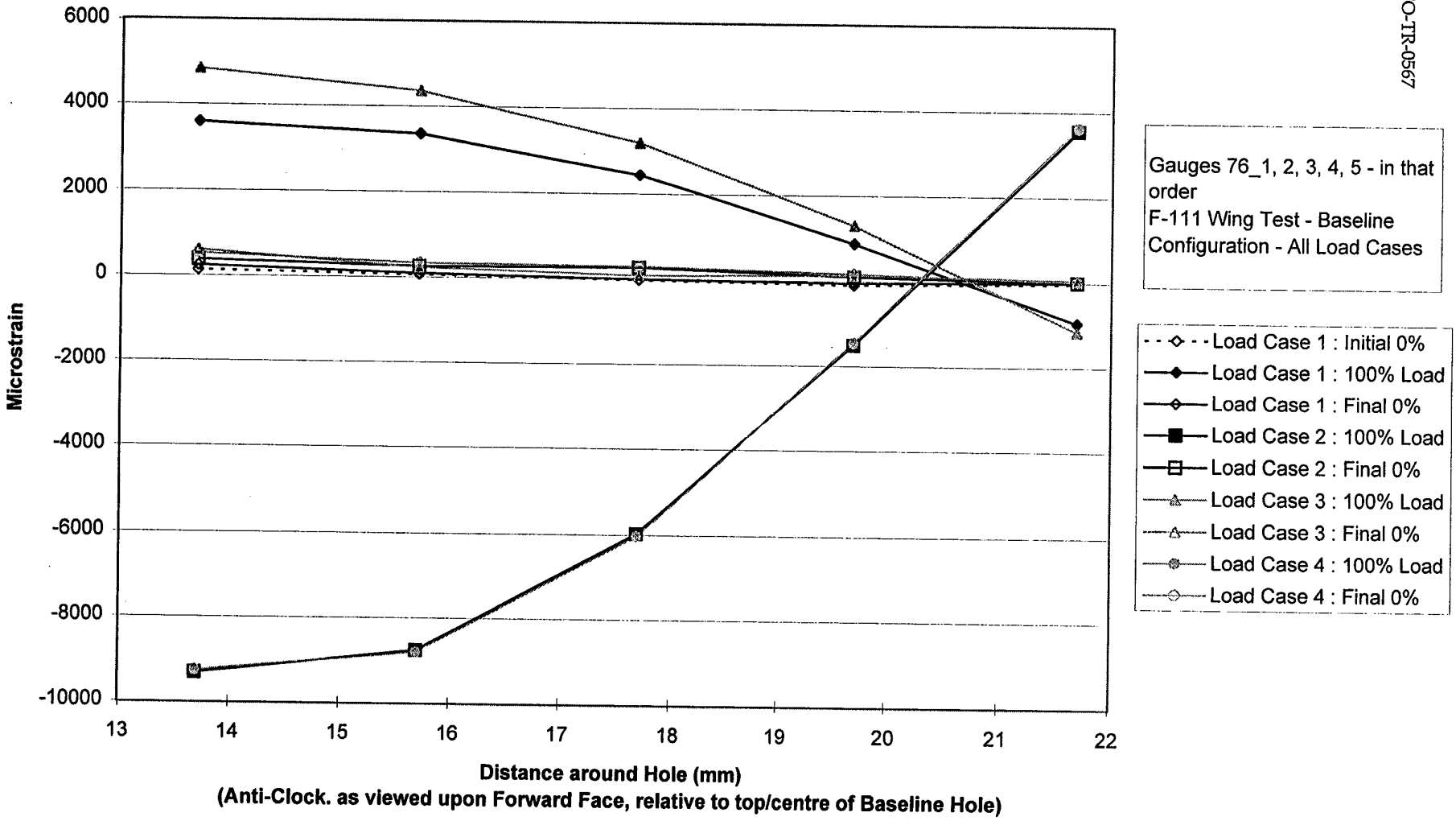

Figure C24 : Peak and Zero Strain Distribution Around FFVH#14 Upper Outboard Corner

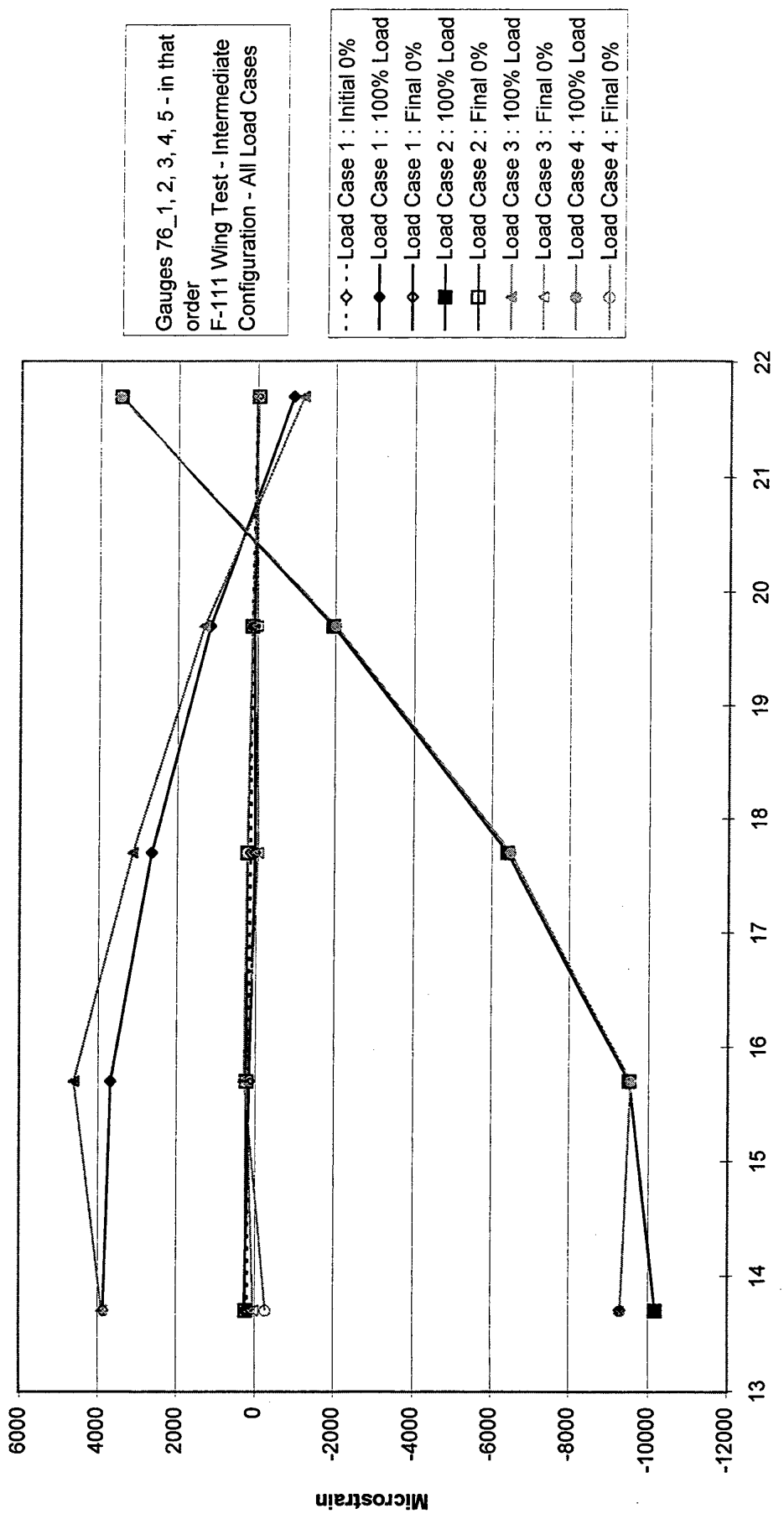

Figure C25 : Peak and Zero Strain Distribution Around FFVH#14 Upper Outboard Corner

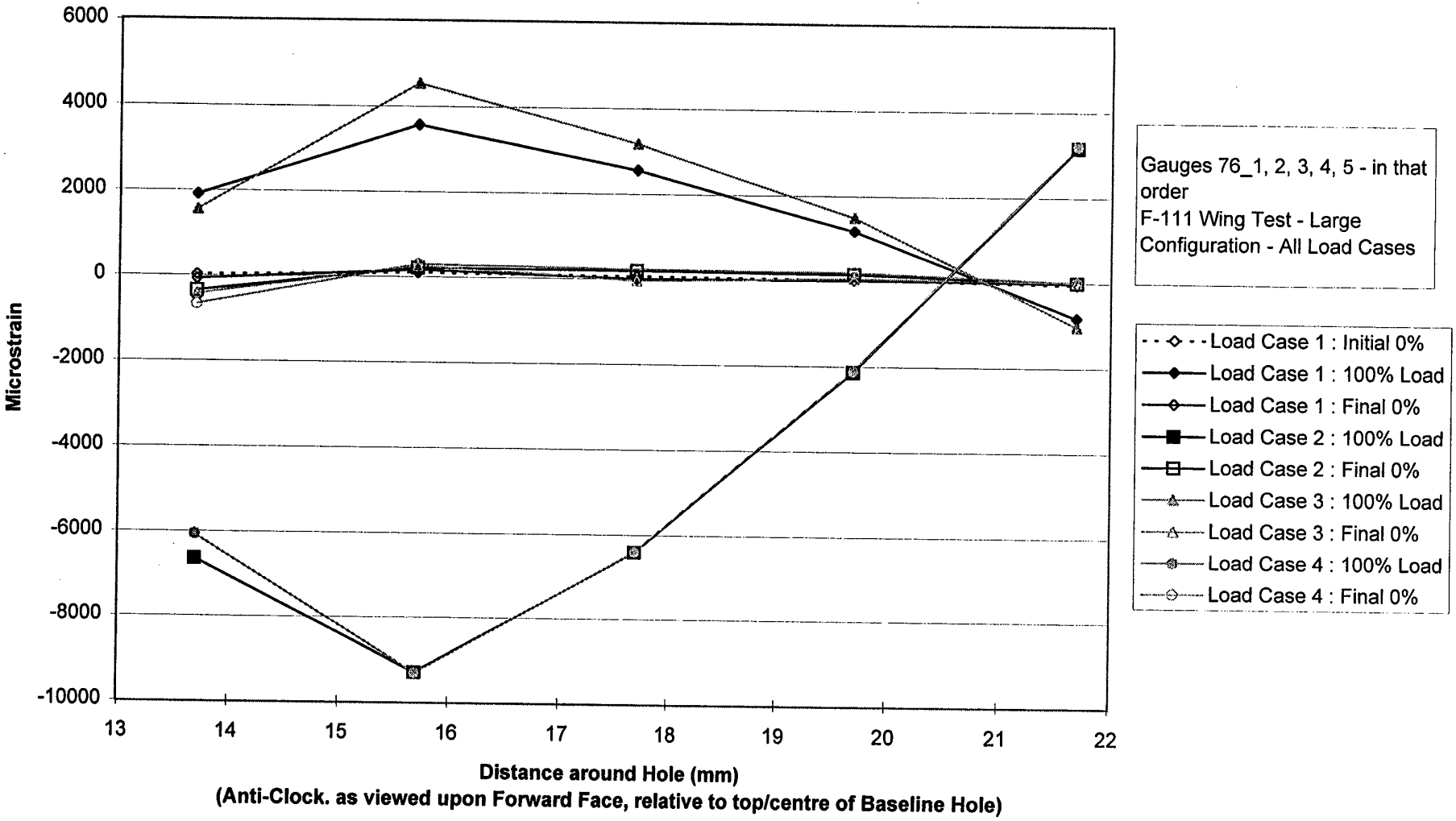

Figure C26 : Peak and Zero Strain Distribution Around FFVH#14 Upper Outboard Corner

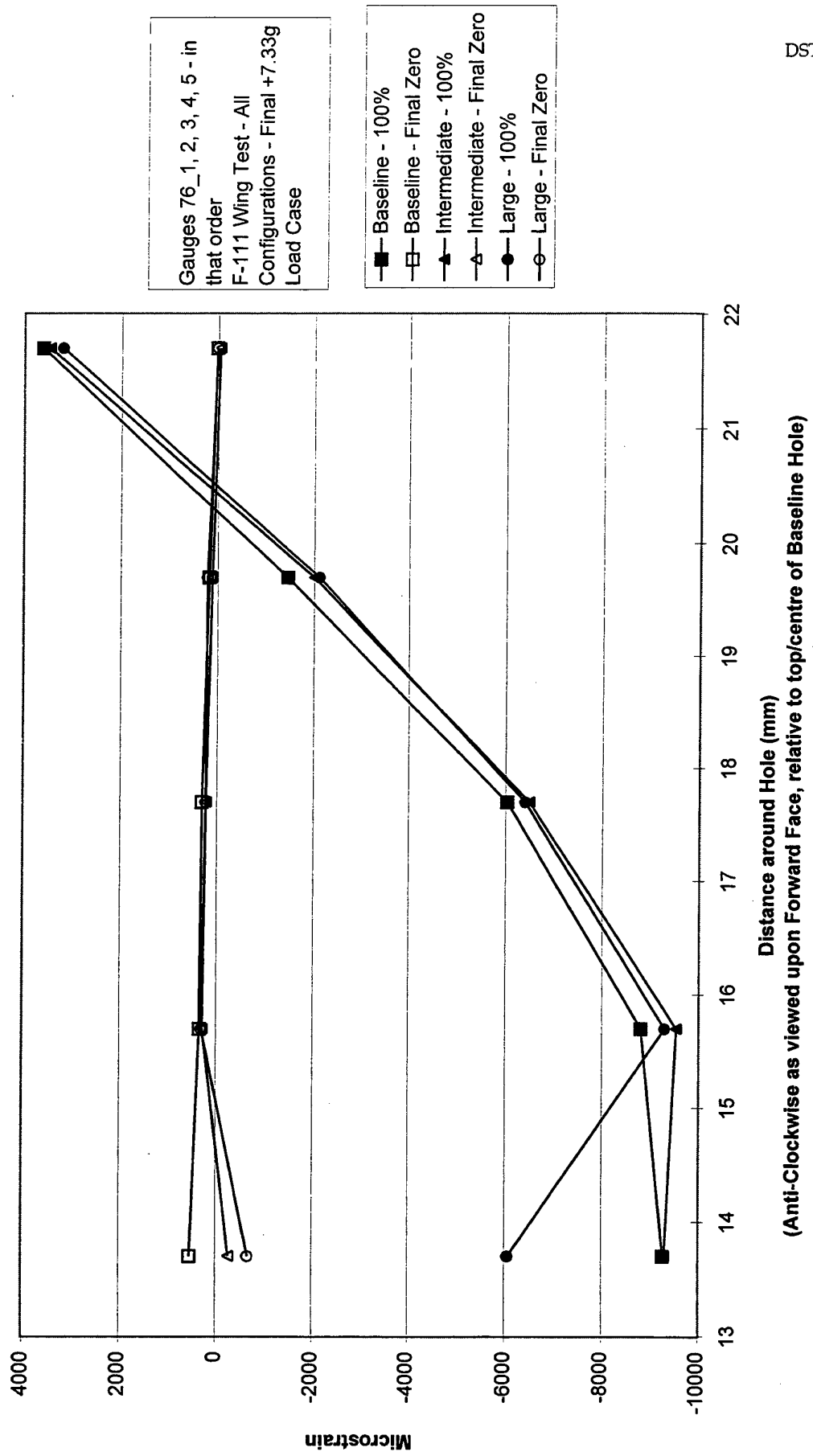

Figure C27 : Peak and Zero Strain Distribution Around FFVH#14 Upper Outboard Corner

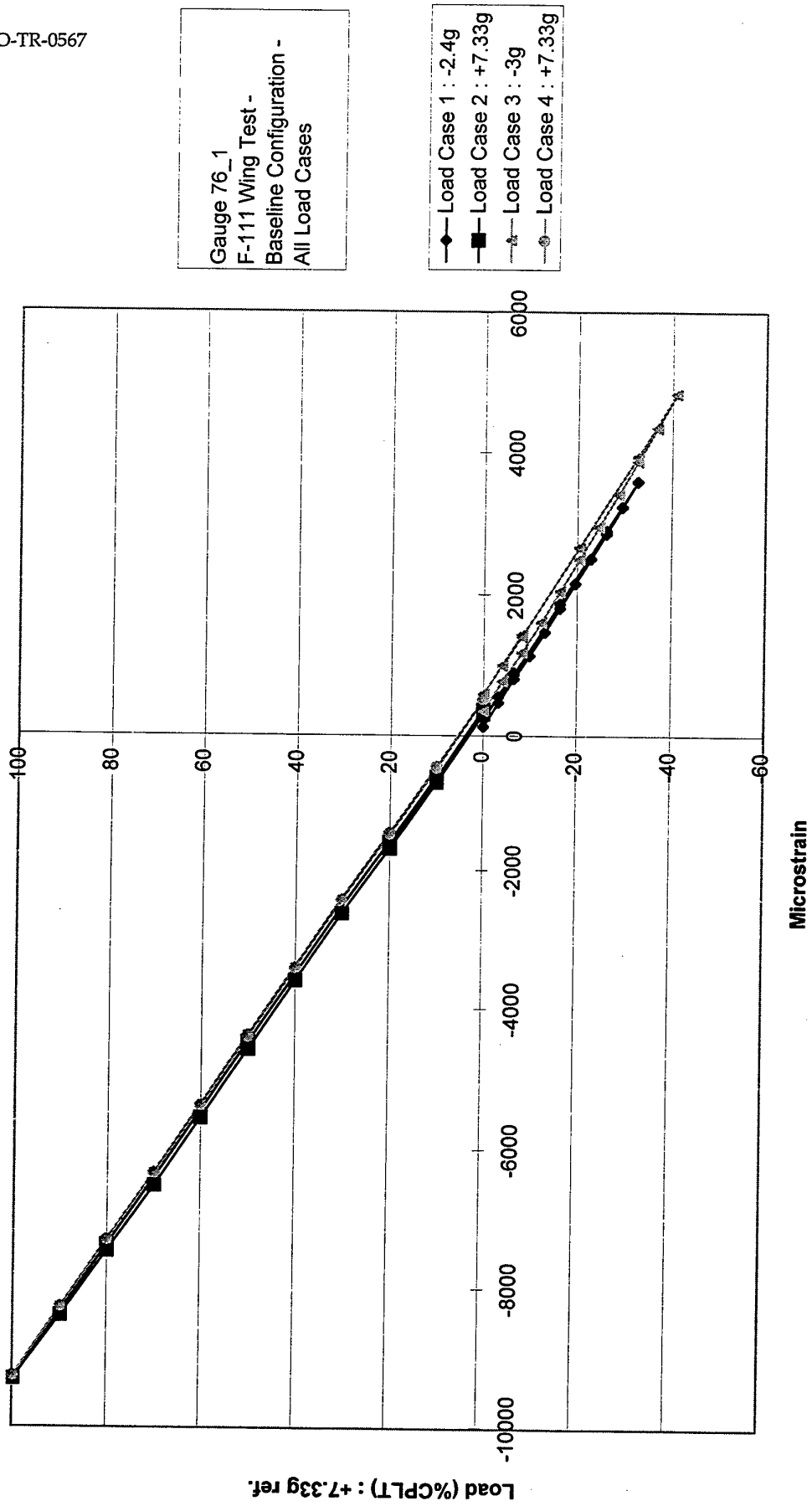

Figure C28 : Strain History For Maximum Strain Gauge In FFVH#14 Upper Outboard Corner

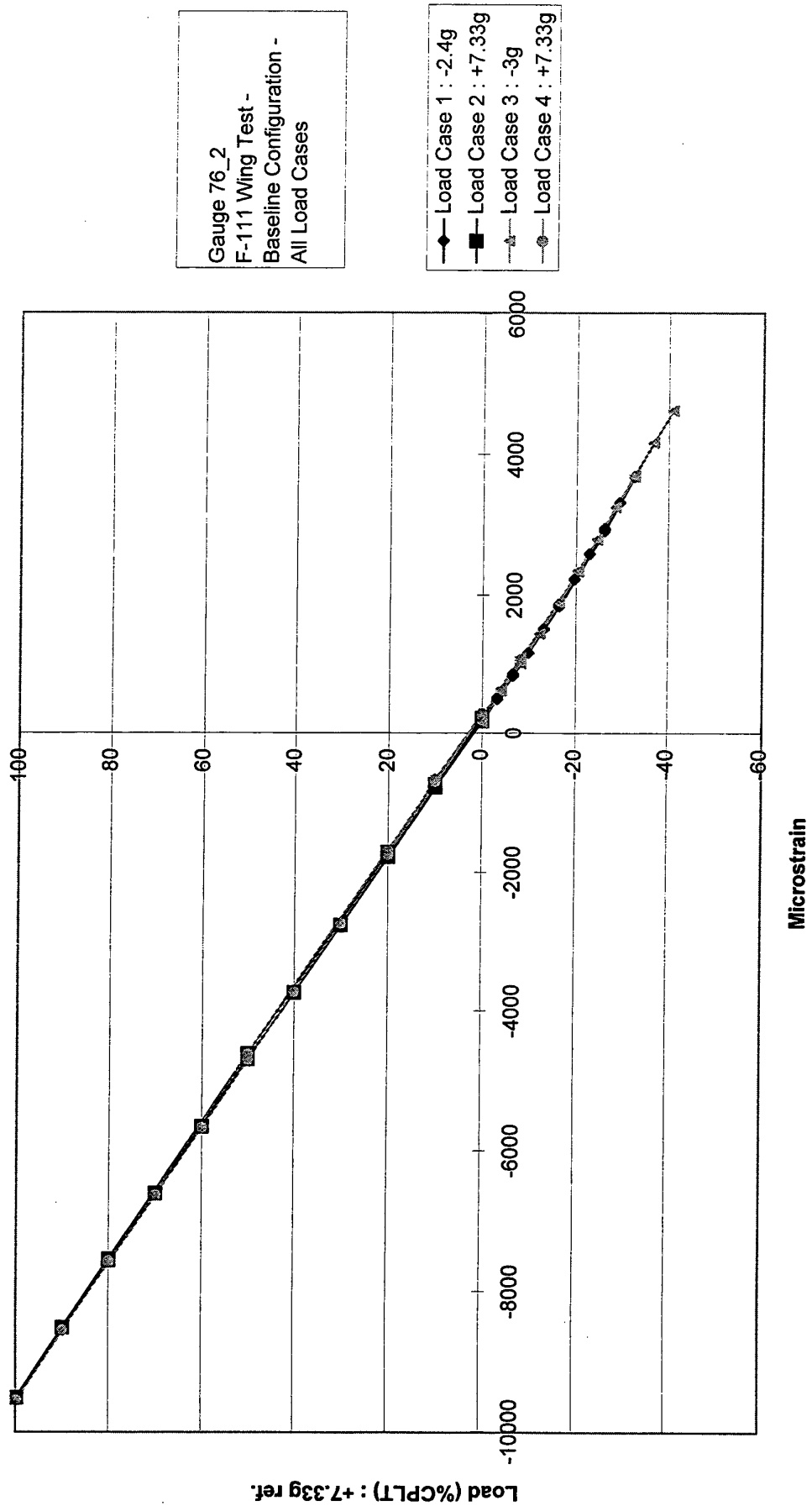

Figure C29 : Strain History For Maximum Strain Gauge In FFVH#14 Upper Outboard Corner

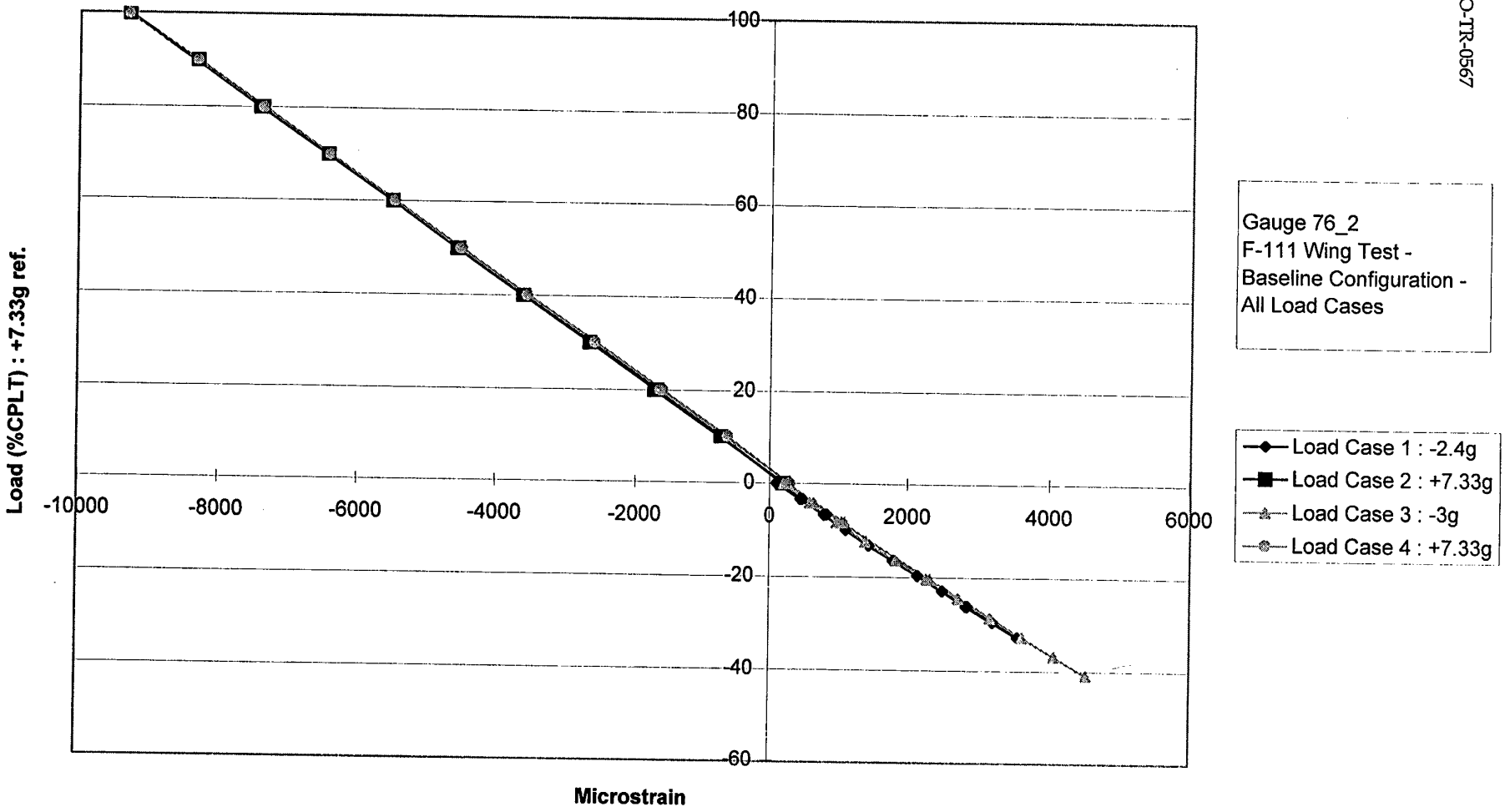

Figure C30 : Strain History For Maximum Strain Gauge In FFVH#14 Upper Outboard Corner

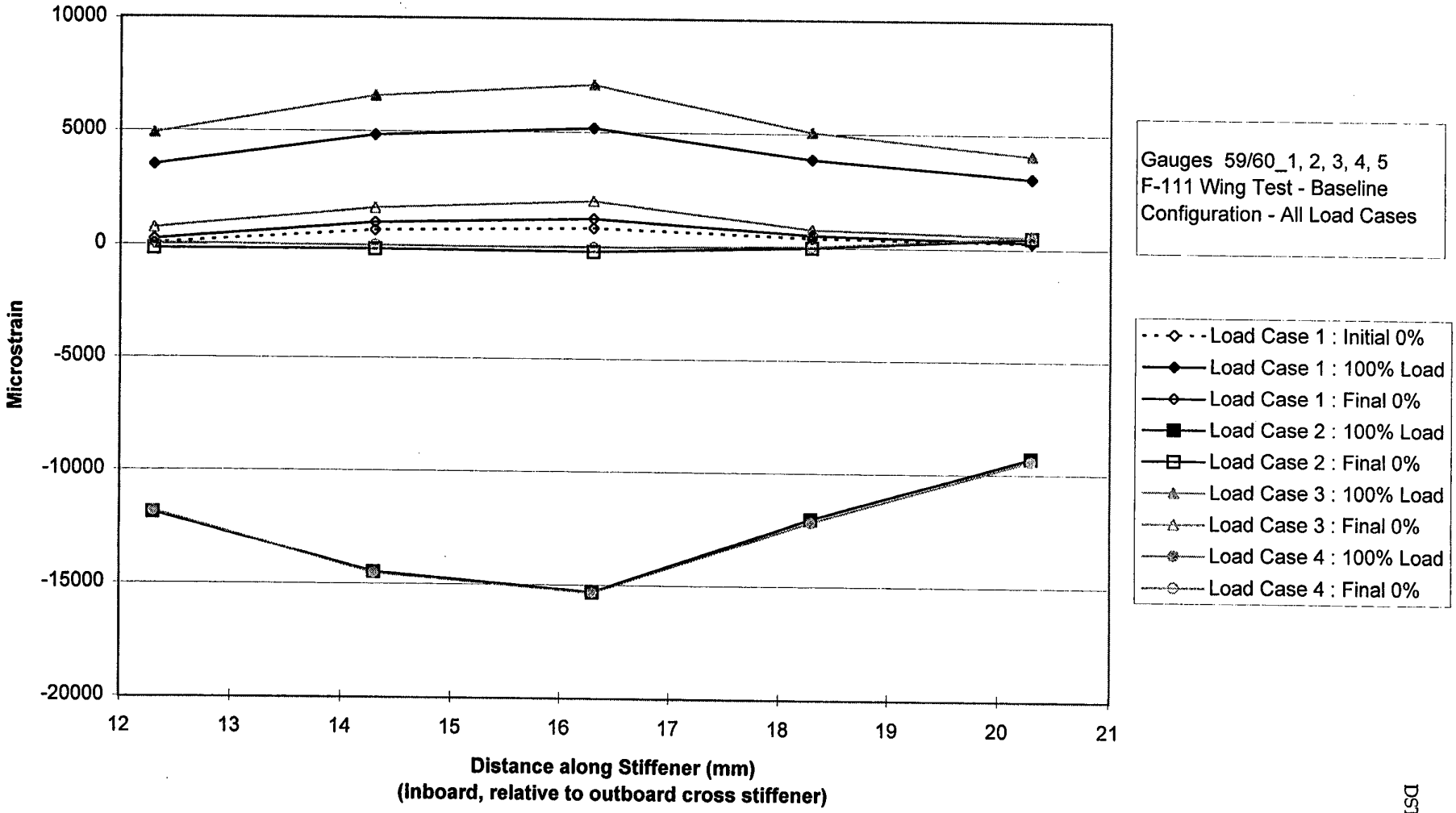

Figure C31 : Peak and Zero Strain Distribution Along Inside Edge Of Stiffener Run-Out #2

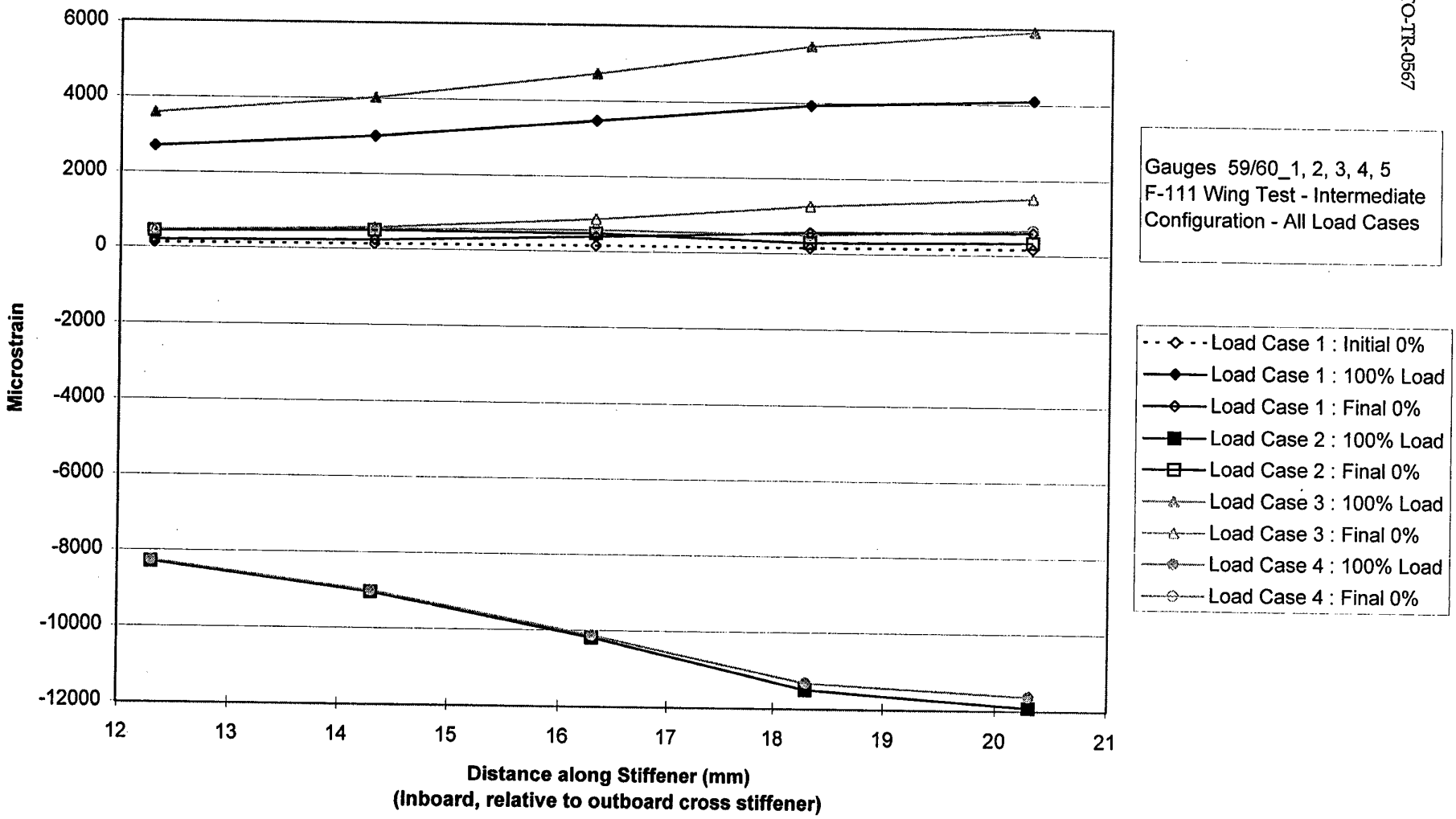

Figure C32 : Peak and Zero Strain Distribution Along Inside Edge Of Stiffener Run-Out #2

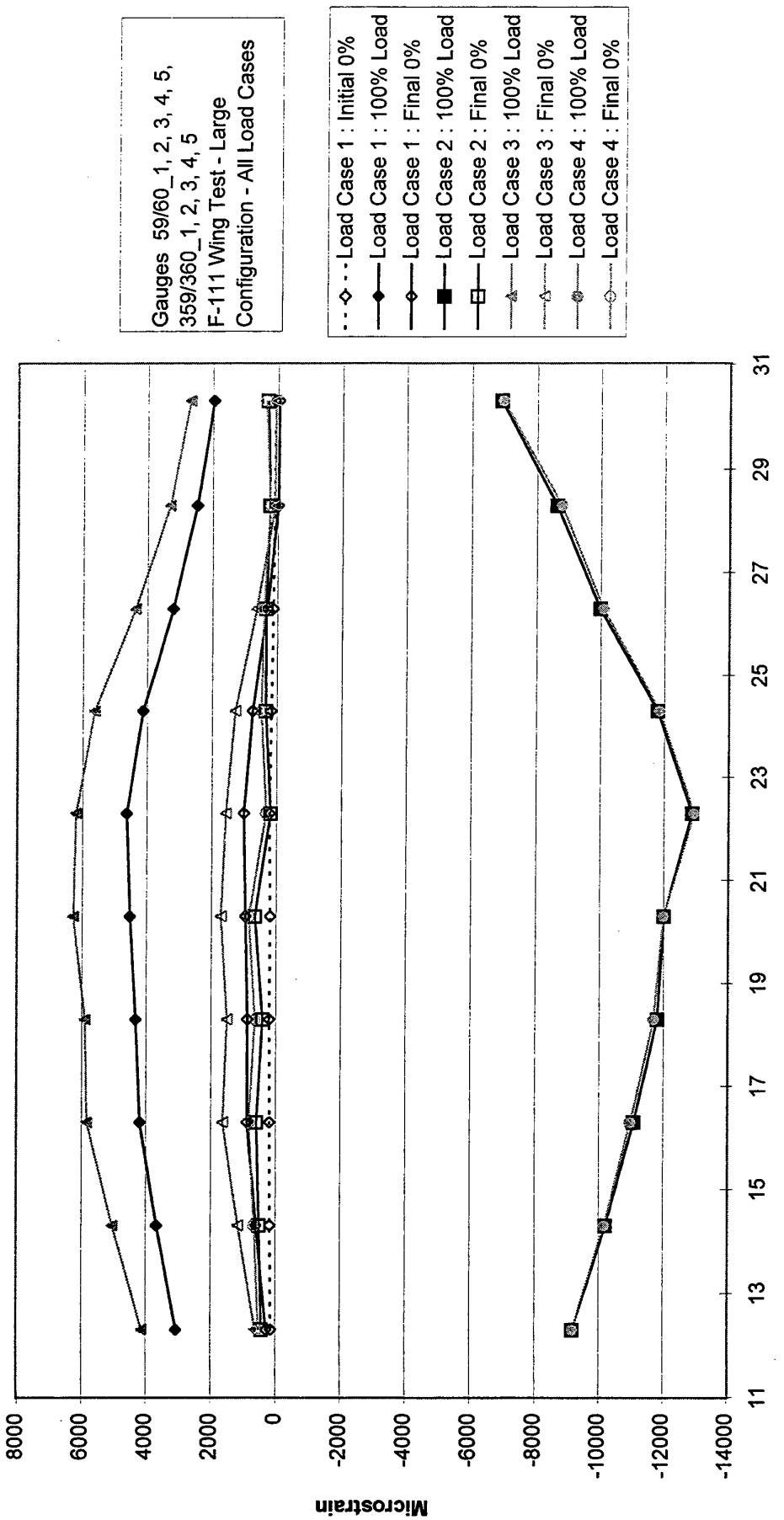

Figure C33 : Peak and Zero Strain Distribution Along Inside Edge Of Stiffener Run-Out #2

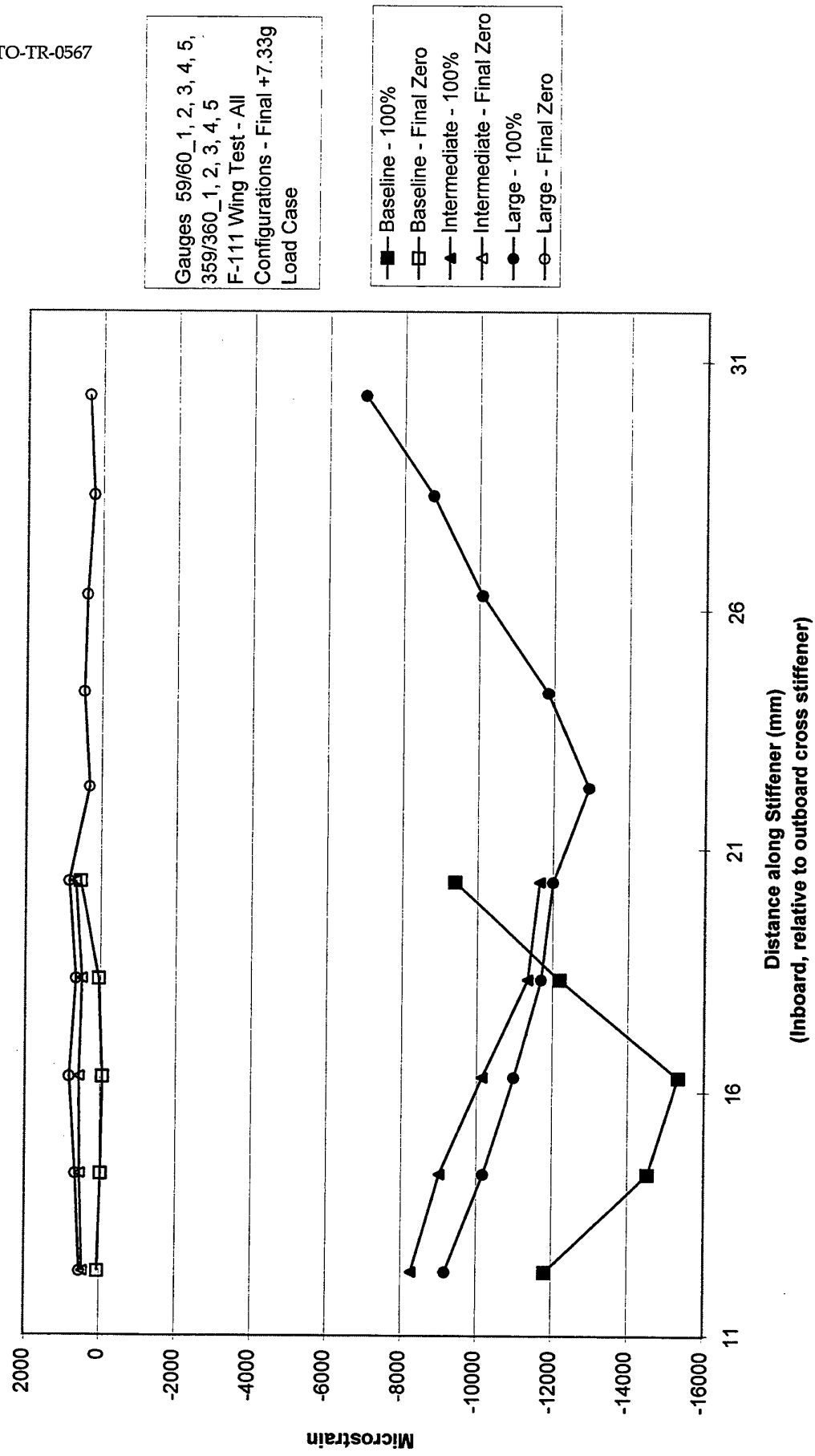

Figure C34 : Peak and Zero Strain Distribution Along Inside Edge Of Stiffener Run-Out #2

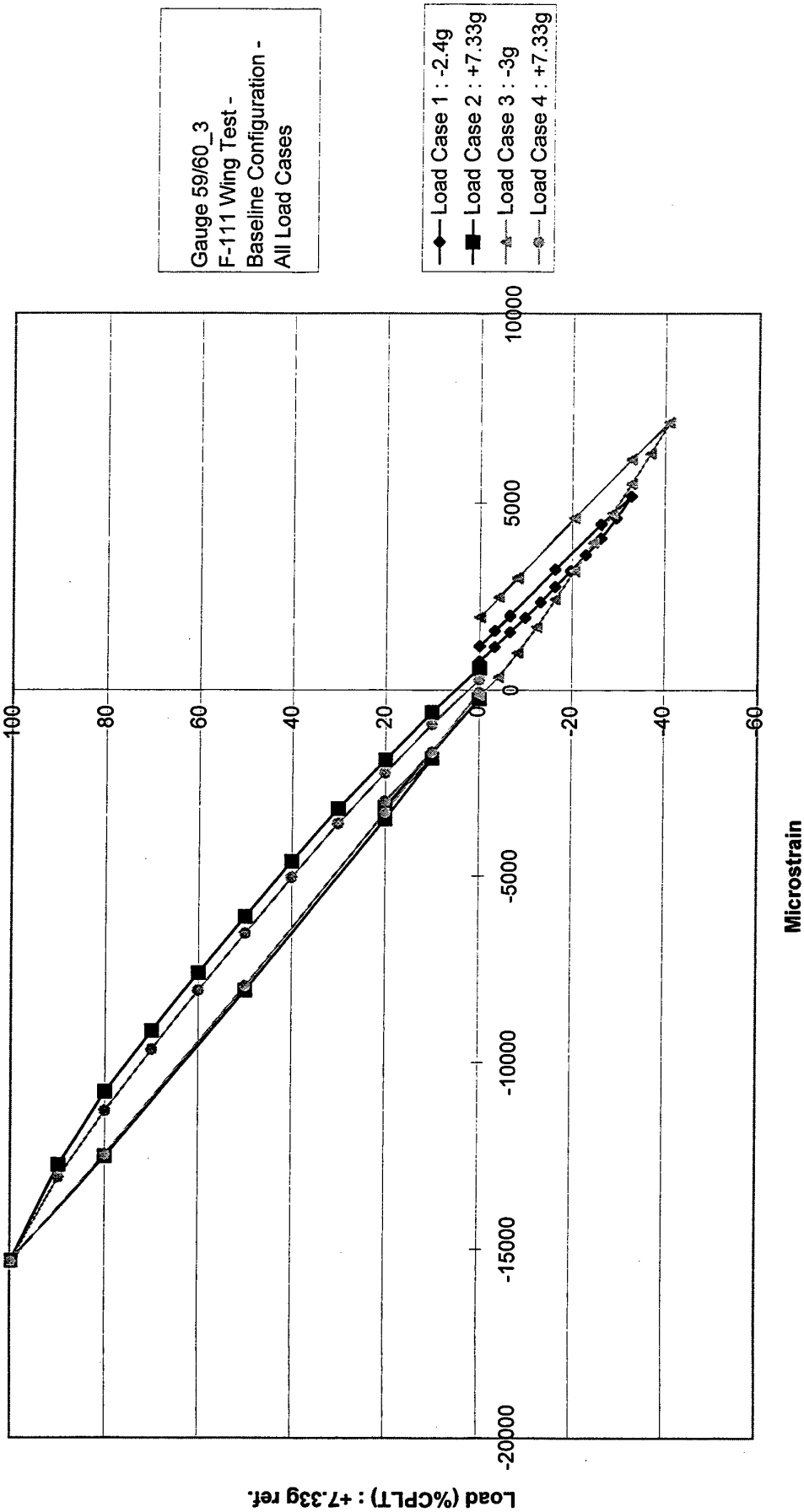

Figure C35 : Strain History For Maximum Strain Gauge Along Inside Edge Of Stiffener Run-Out #2

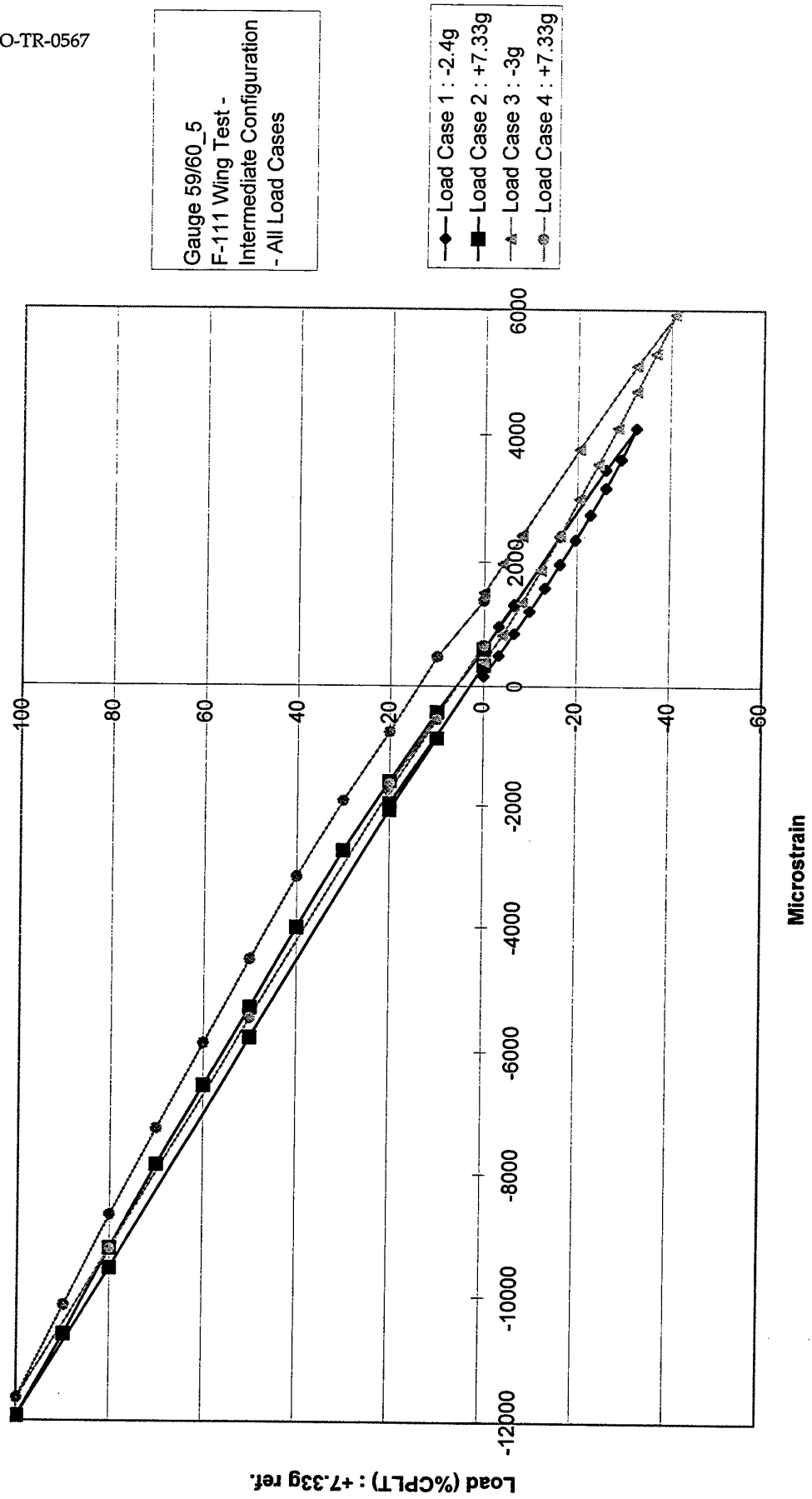

Figure C36 : Strain History For Maximum Strain Gauge Along Inside Edge Of Stiffener Run-Out #2

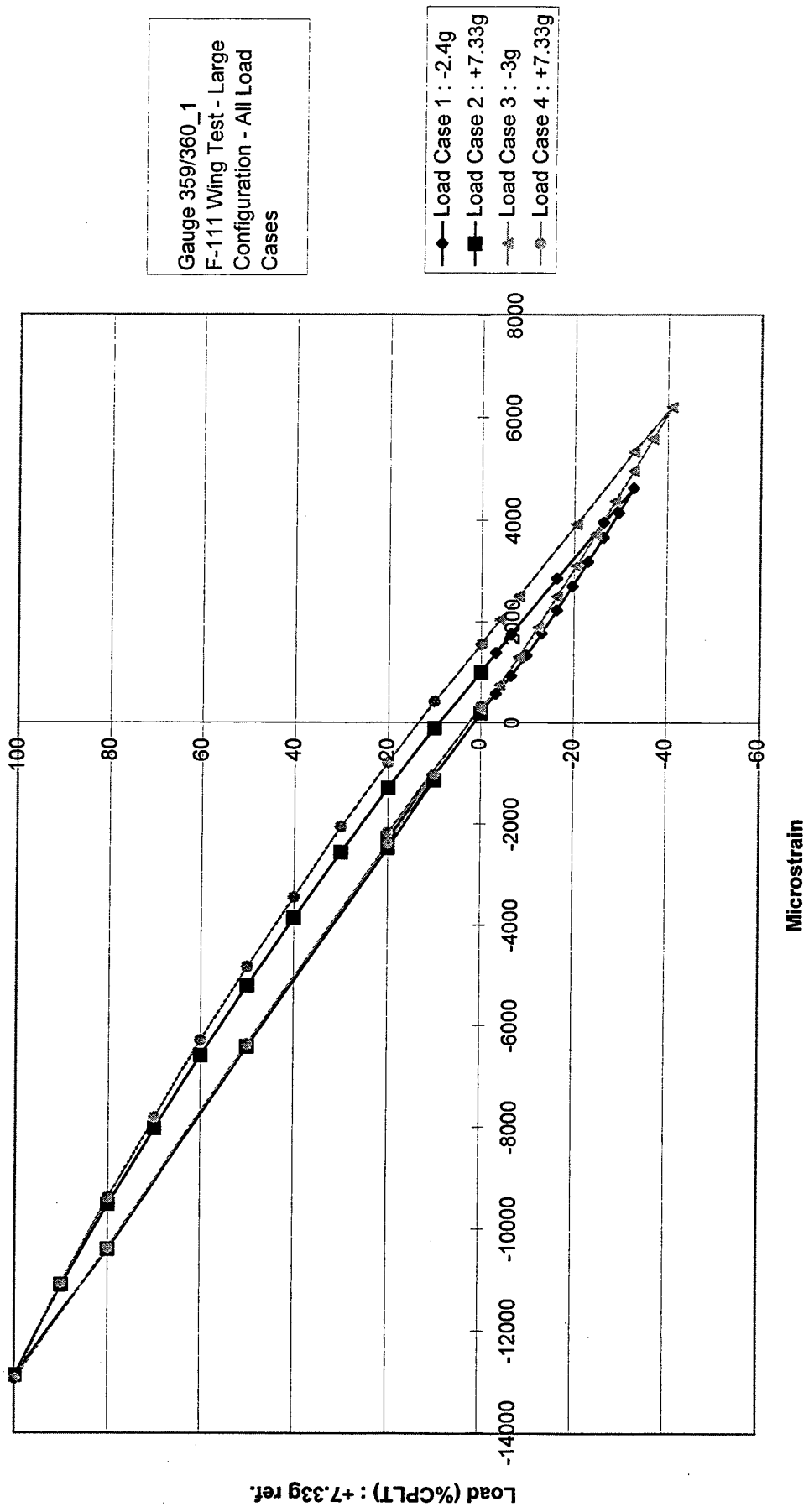

Figure C37 : Strain History For Maximum Strain Gauge Along Inside Edge Of Stiffener Run-Out #2

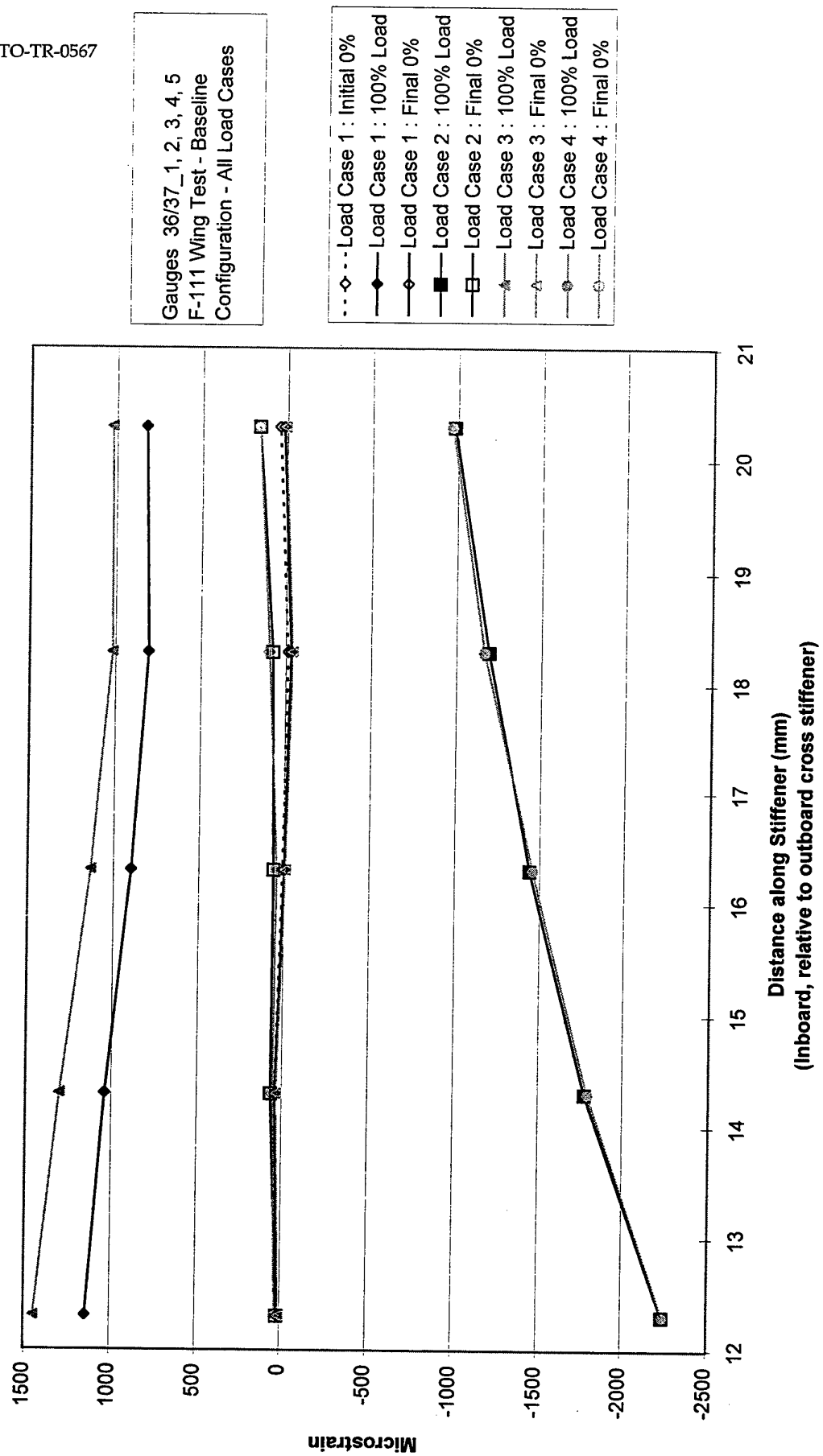

Figure C38 : Peak and Zero Strain Distribution Along Outside Upper Plate Over Stiffener Run-Out #2

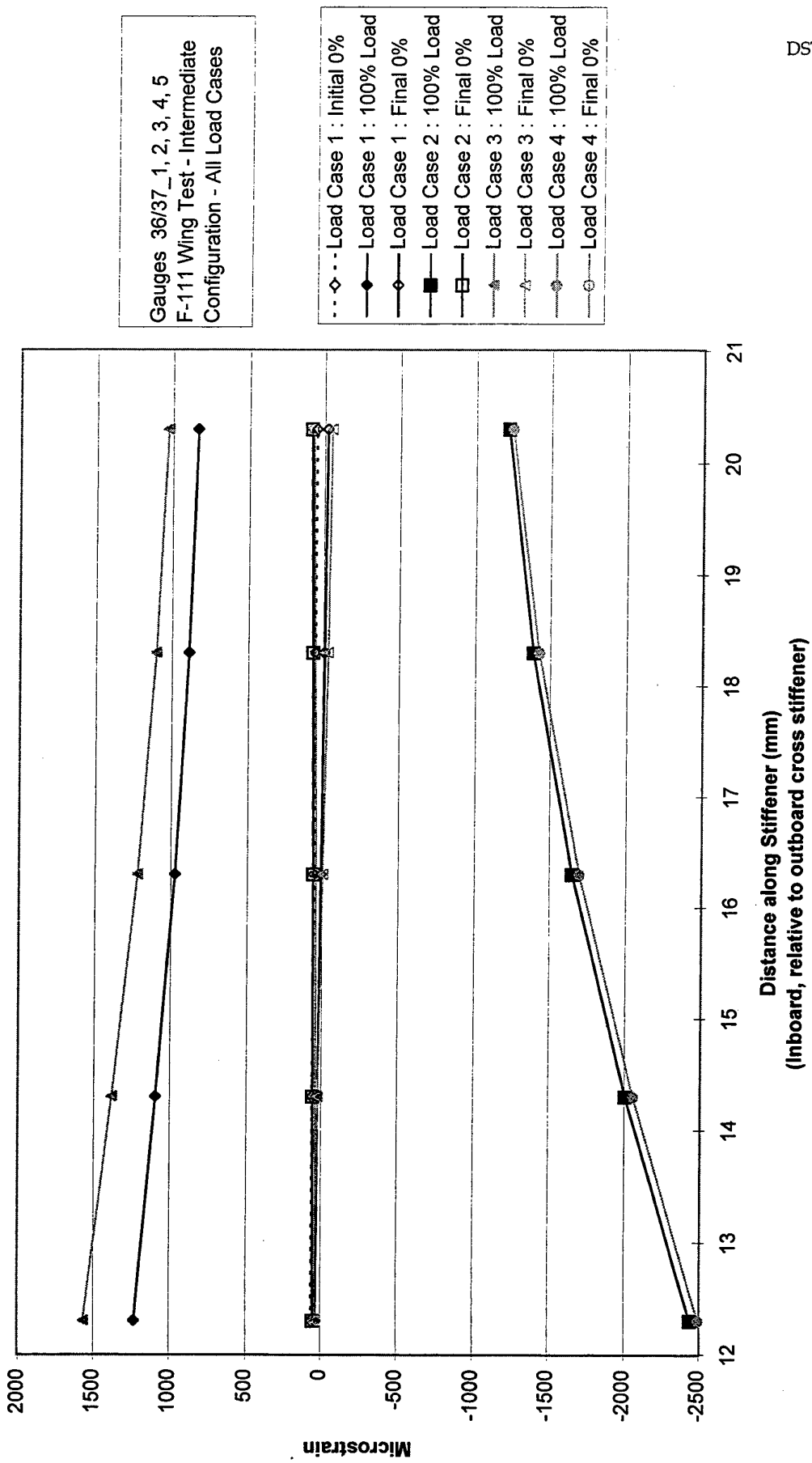

Figure C39 : Peak and Zero Strain Distribution Along Outside Upper Plate Over Stiffener Run-Out #2

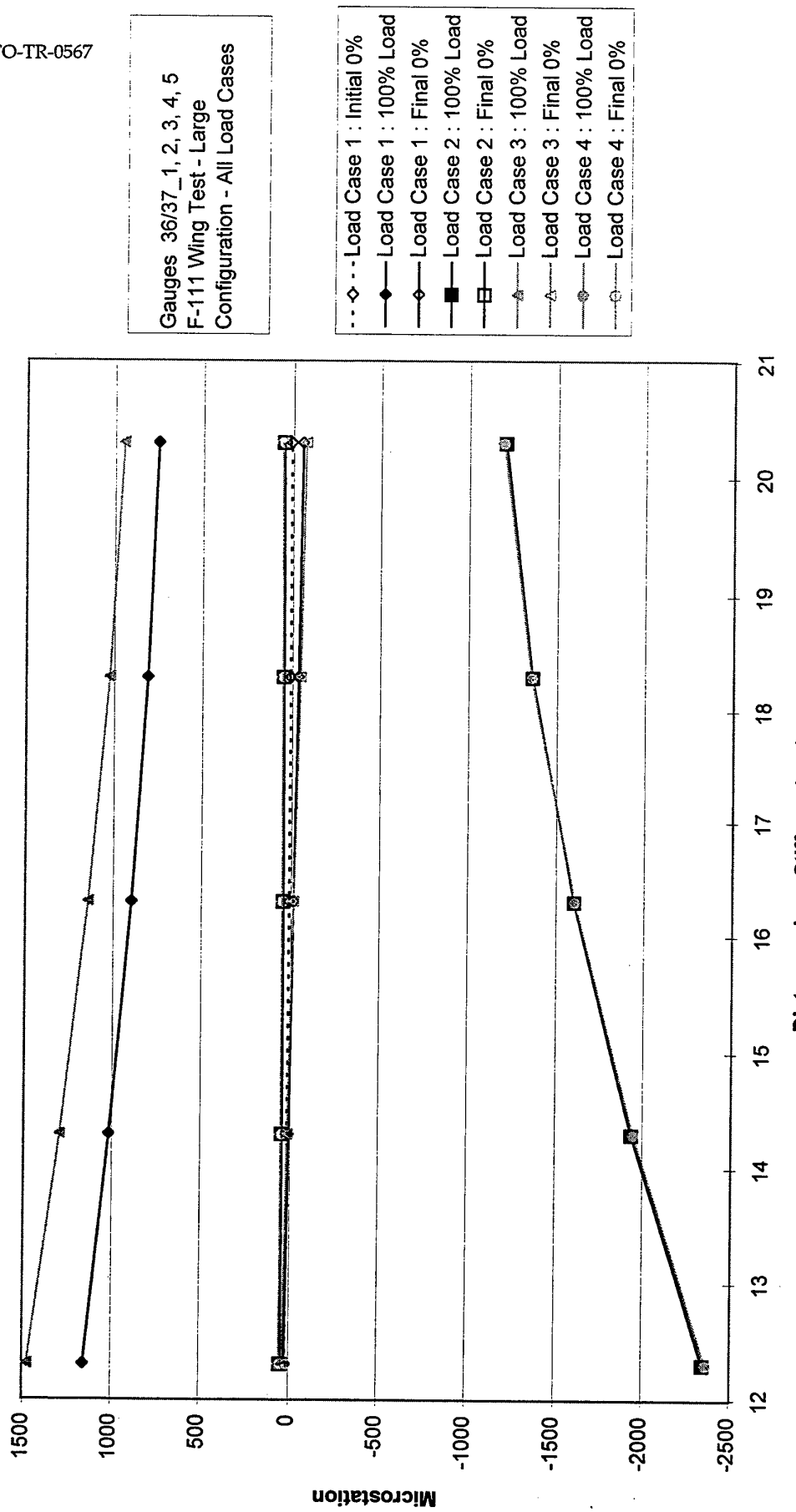

Figure C40 : Peak and Zero Strain Distribution Along Outside Upper Plate Over Stiffener Run-Out #2

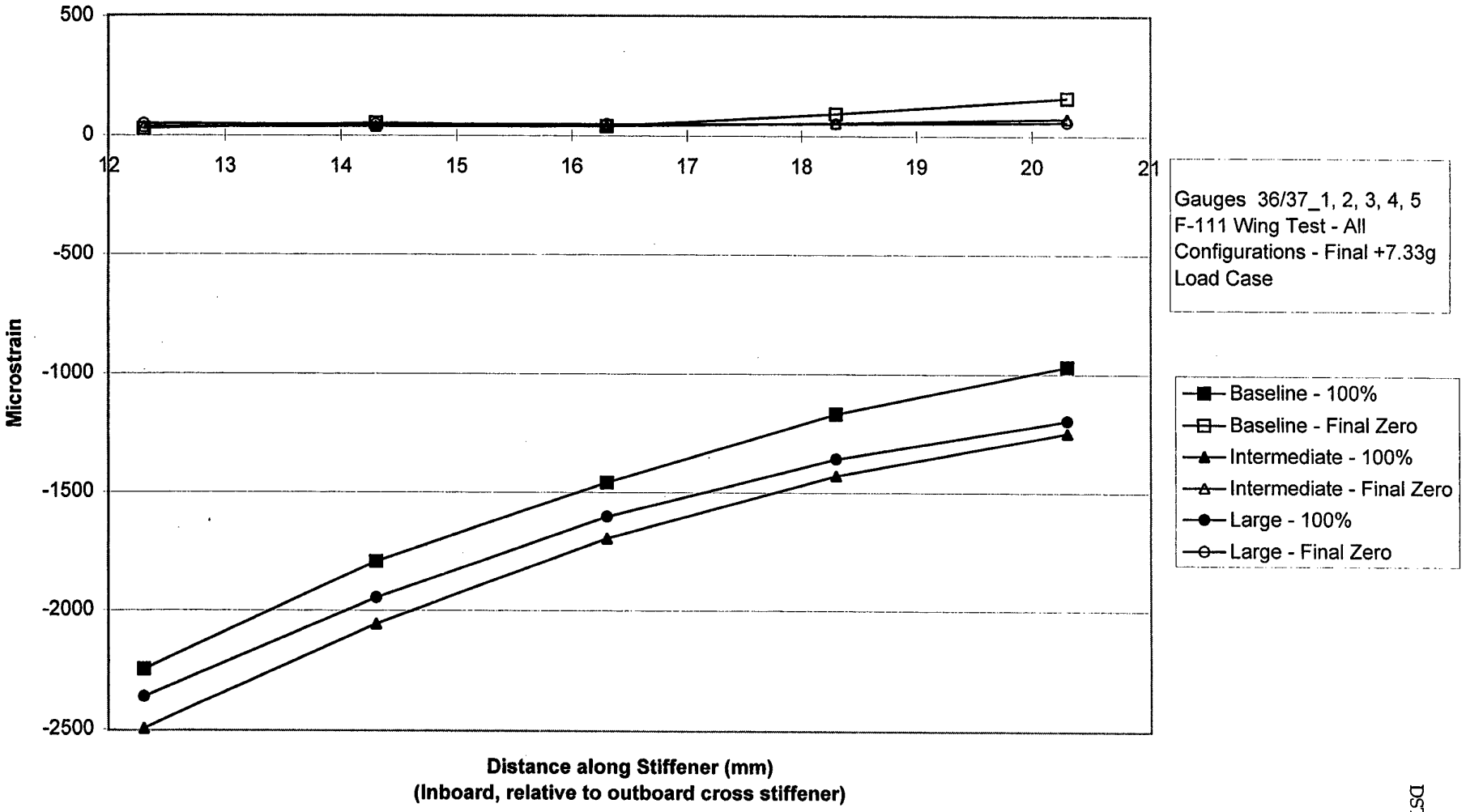

Figure C41 : Peak and Zero Strain Distribution Along Outside Upper Plate Over Stiffener Run-Out #2

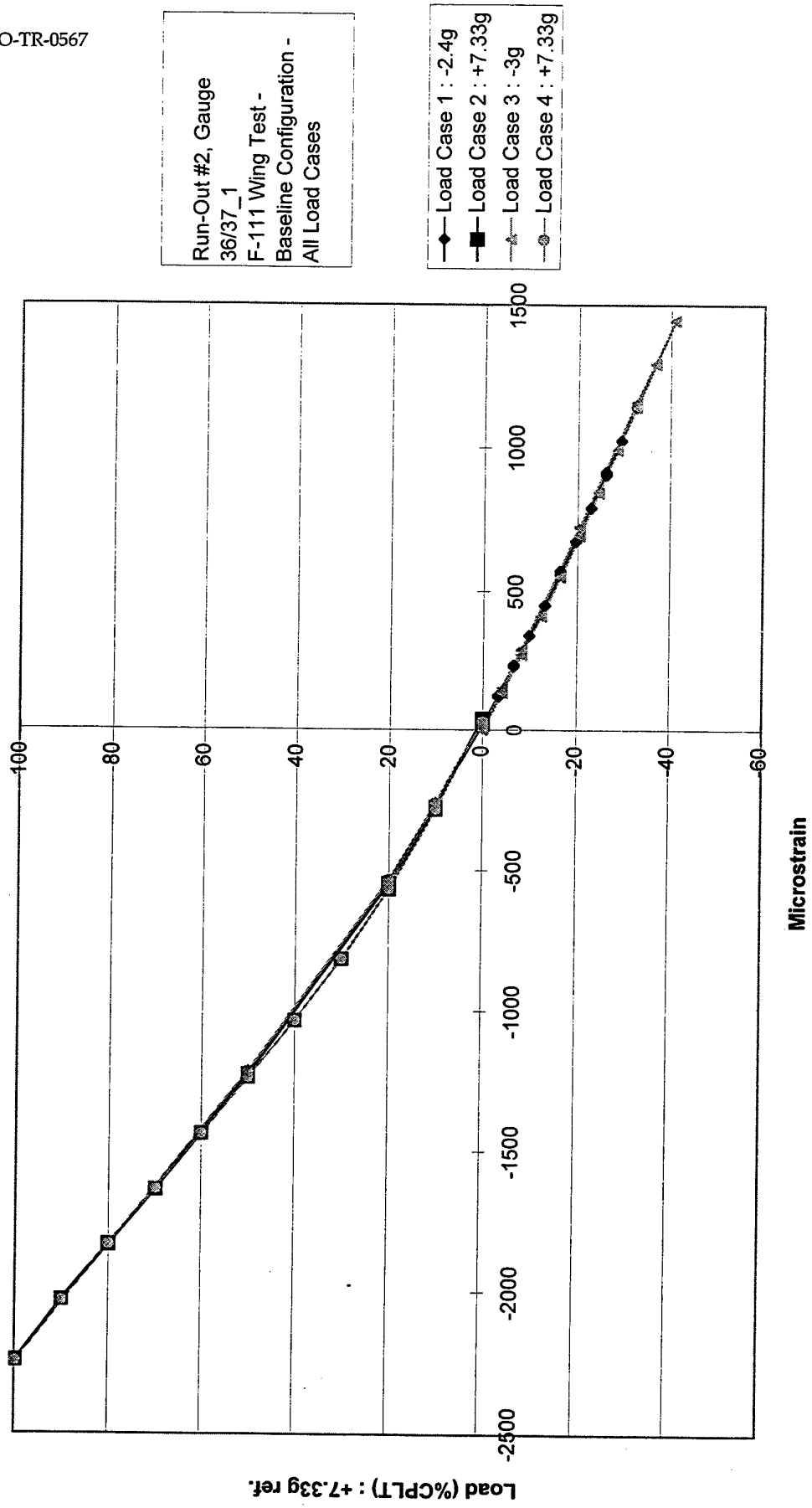

Figure C42 : Strain History For Maximum Strain Gauge Along Outside Upper Plate Over Stiffener

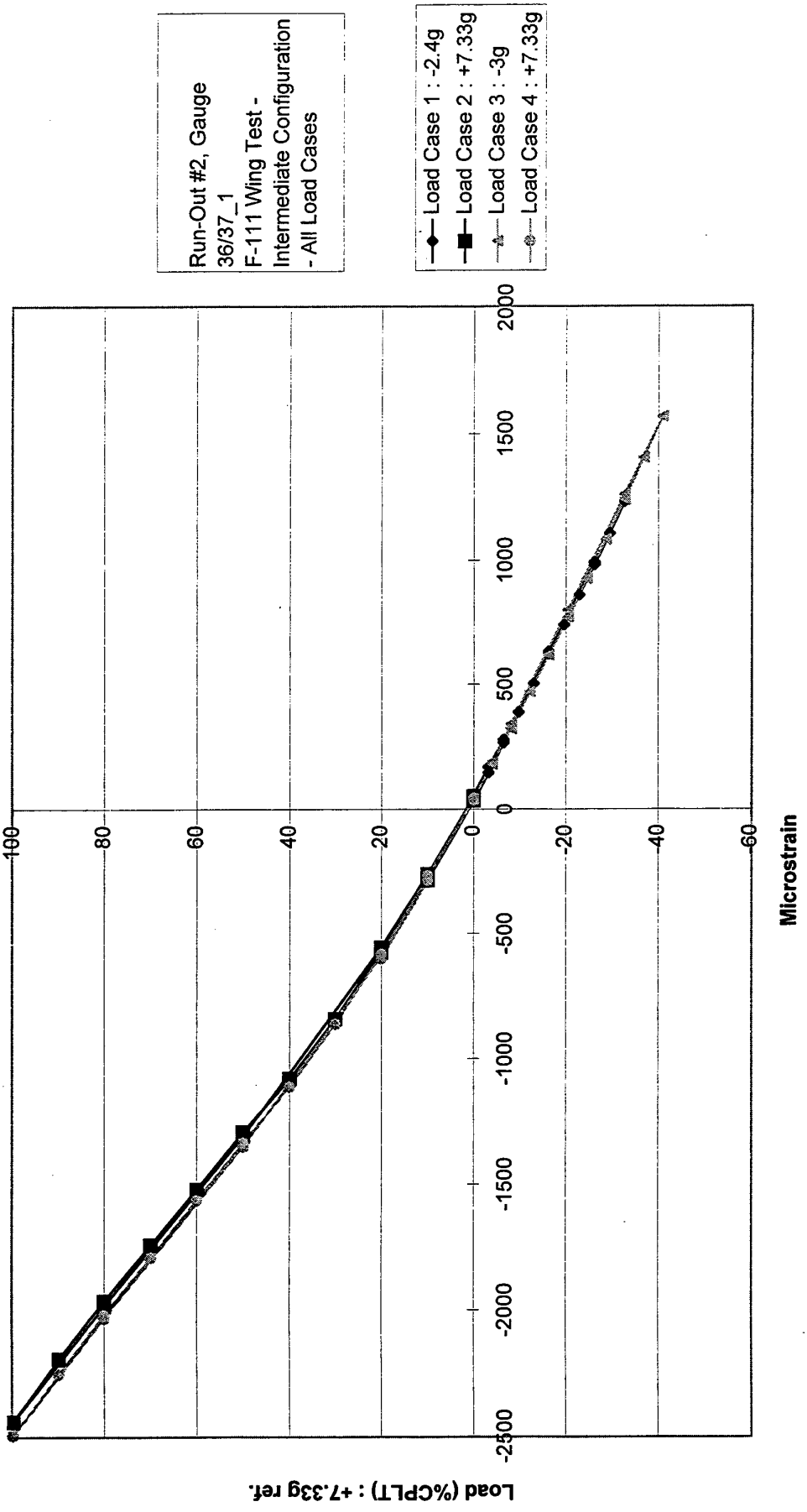

Figure C43 : Strain History For Maximum Strain Gauge Along Outside Upper Plate Over Stiffener

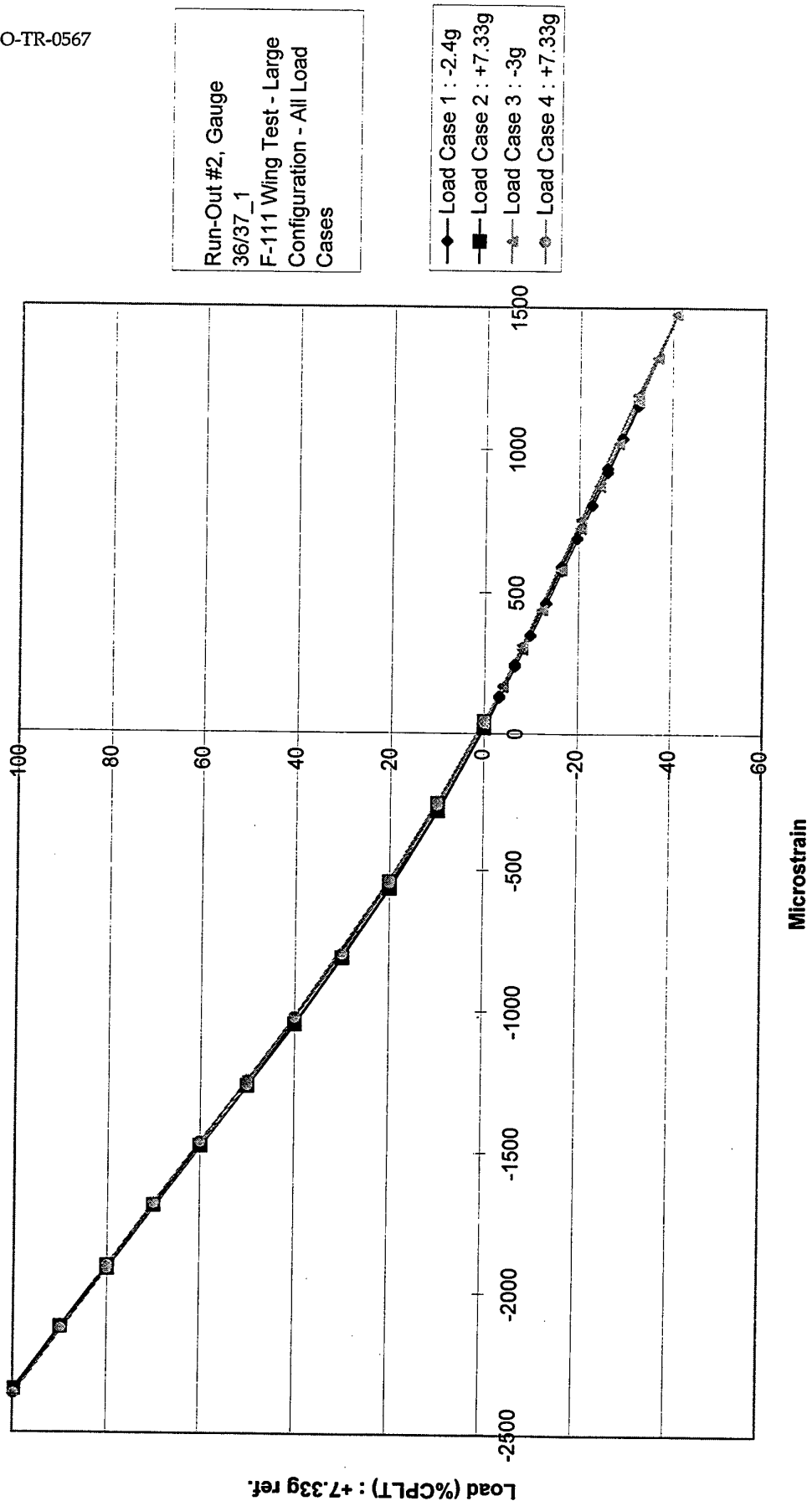

Figure C44 : Strain History For Maximum Strain Gauge Along Outside Upper Plate Over Stiffener

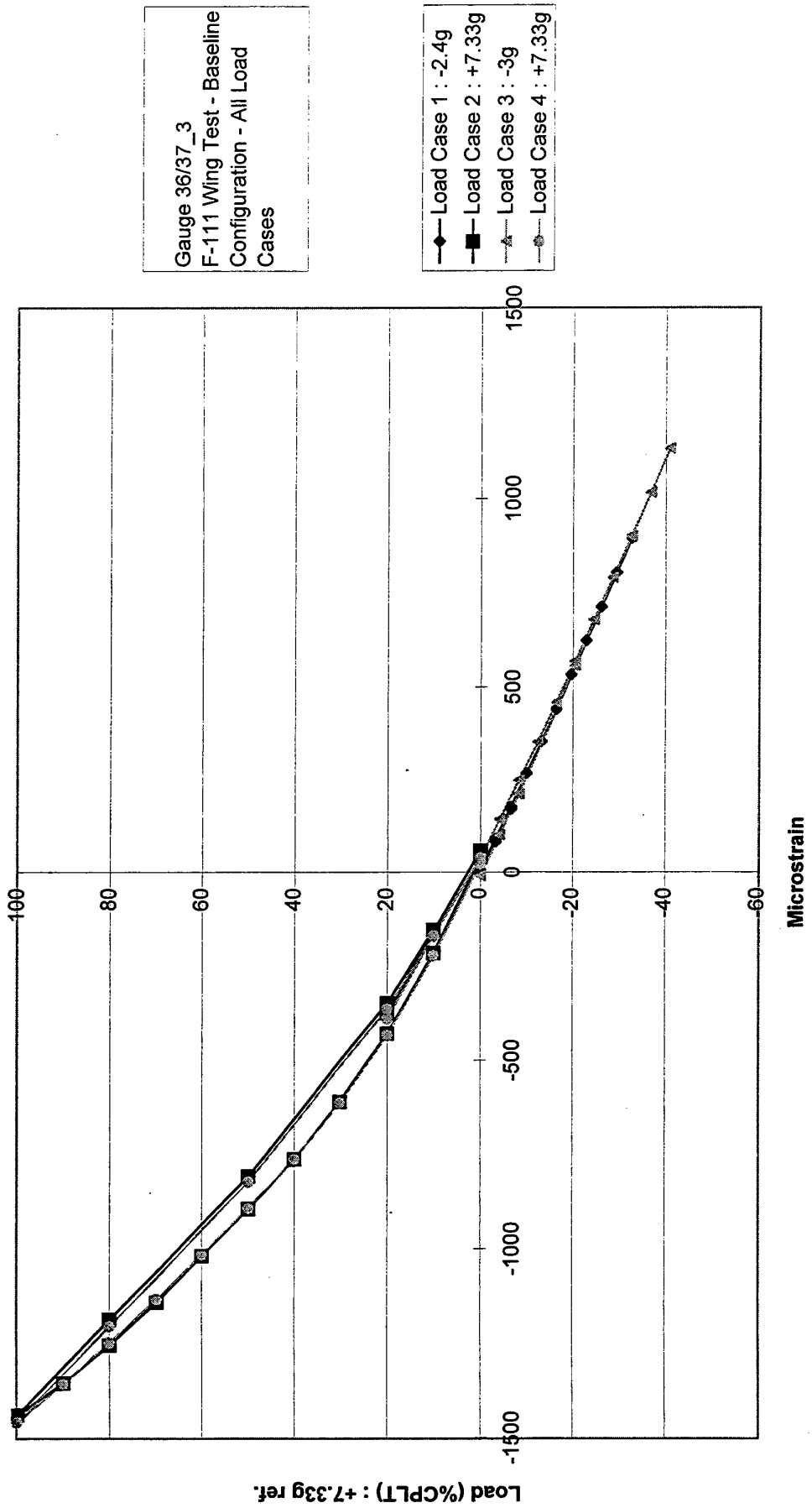

Figure C45 : Strain History For Strain Gauge Along Outside Upper Plate Over Stiffener Run-Out #2

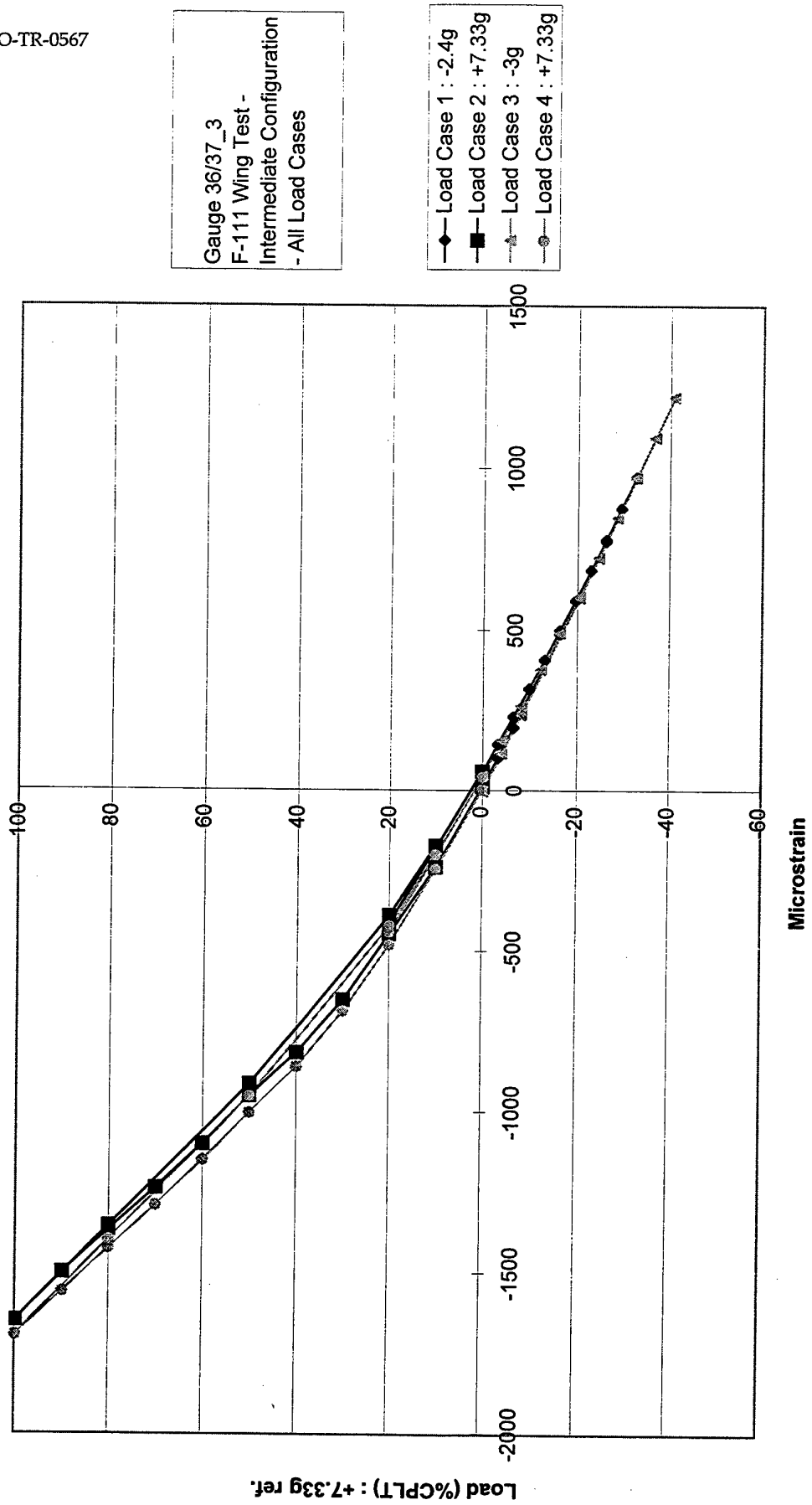

Figure C46 : Strain History For Strain Gauge Along Outside Upper Plate Over Stiffener Run-Out #2

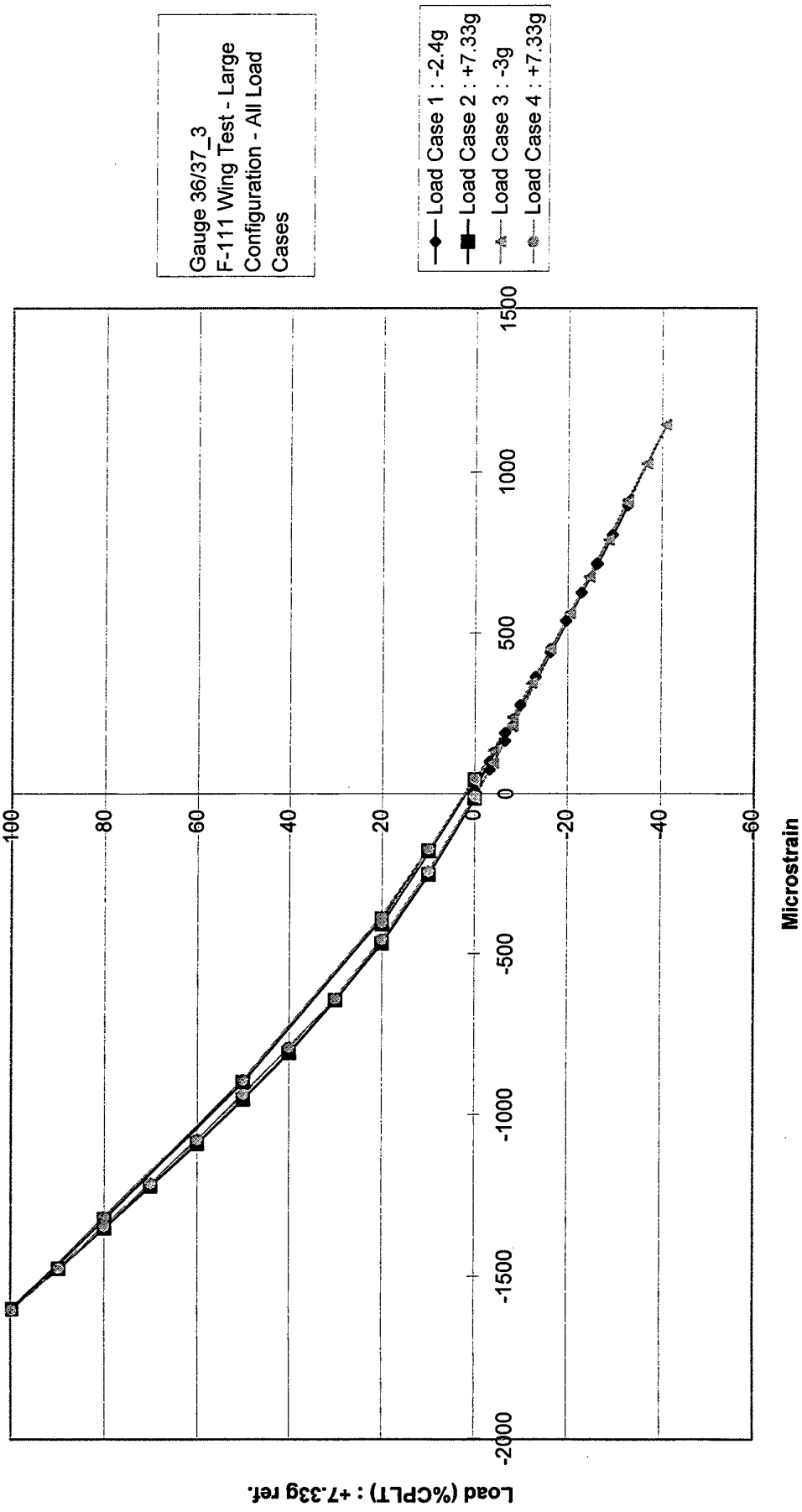

Figure C47 : Strain History For Strain Gauge Along Outside Upper Plate Over Stiffener Run-Out #2

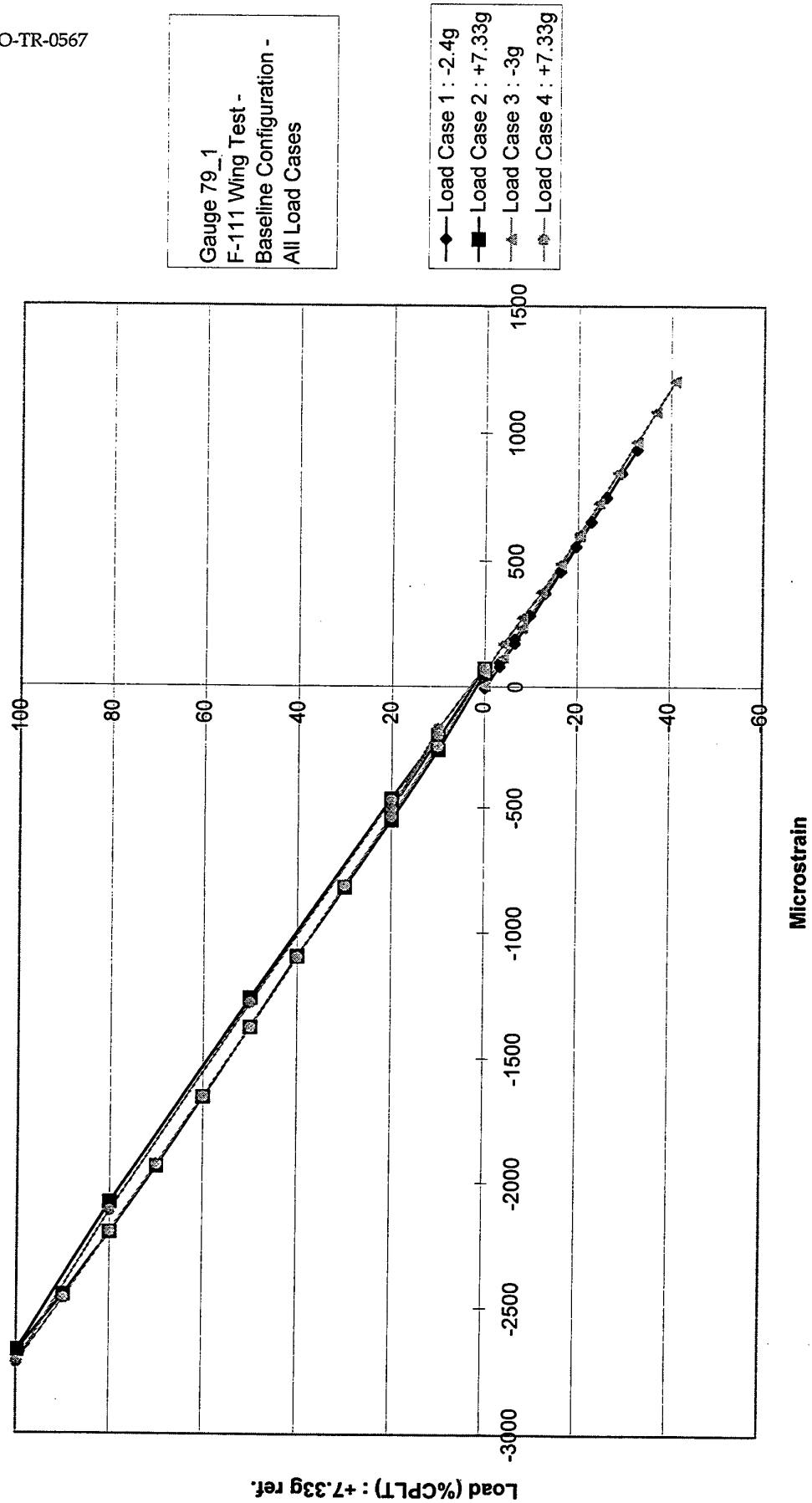

Figure C48 : Strain History For Strain Gauge Stiffener #3 - Aft Face

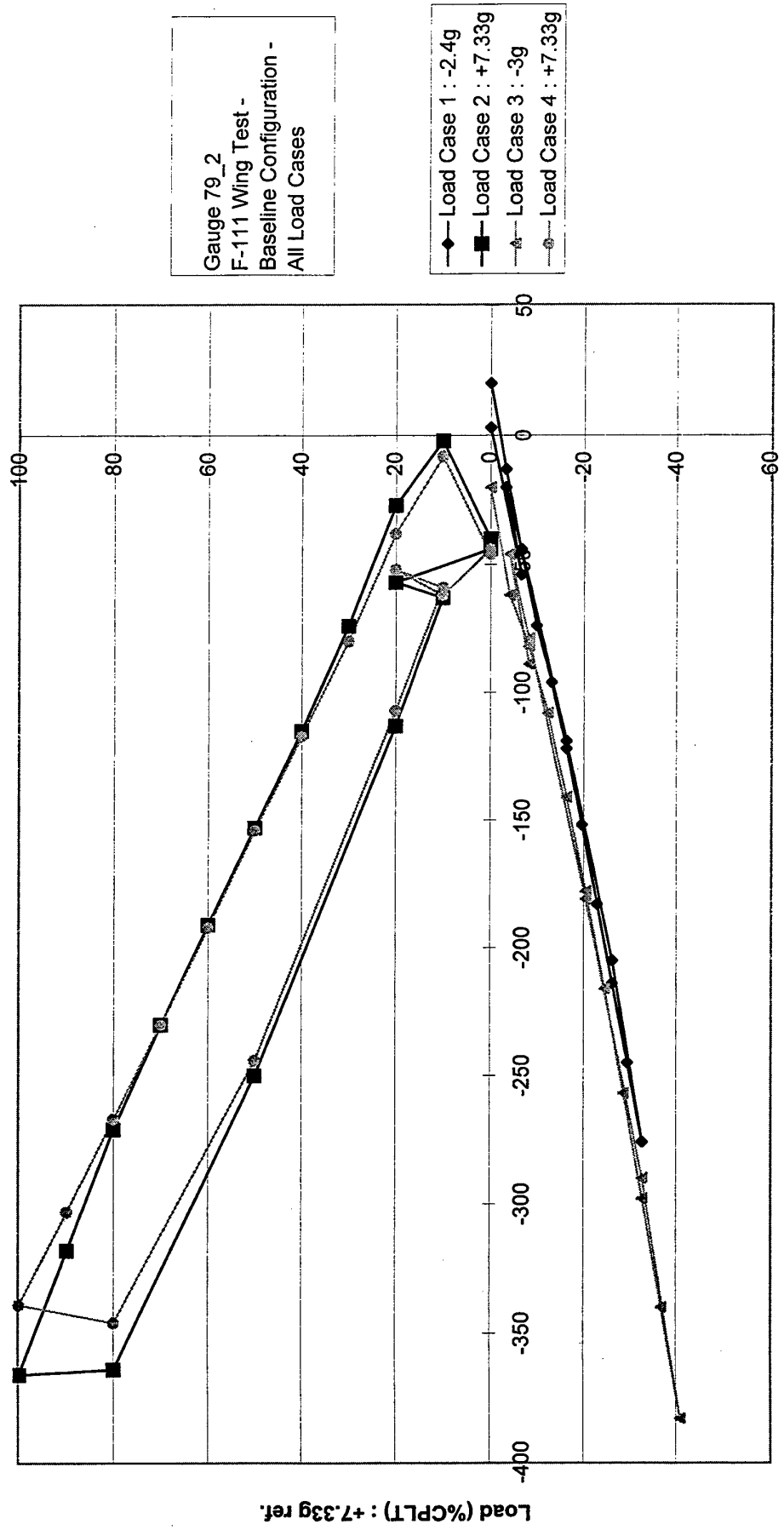

Figure C49 : Strain History For Strain Gauge Stiffener #3 - Aft Face

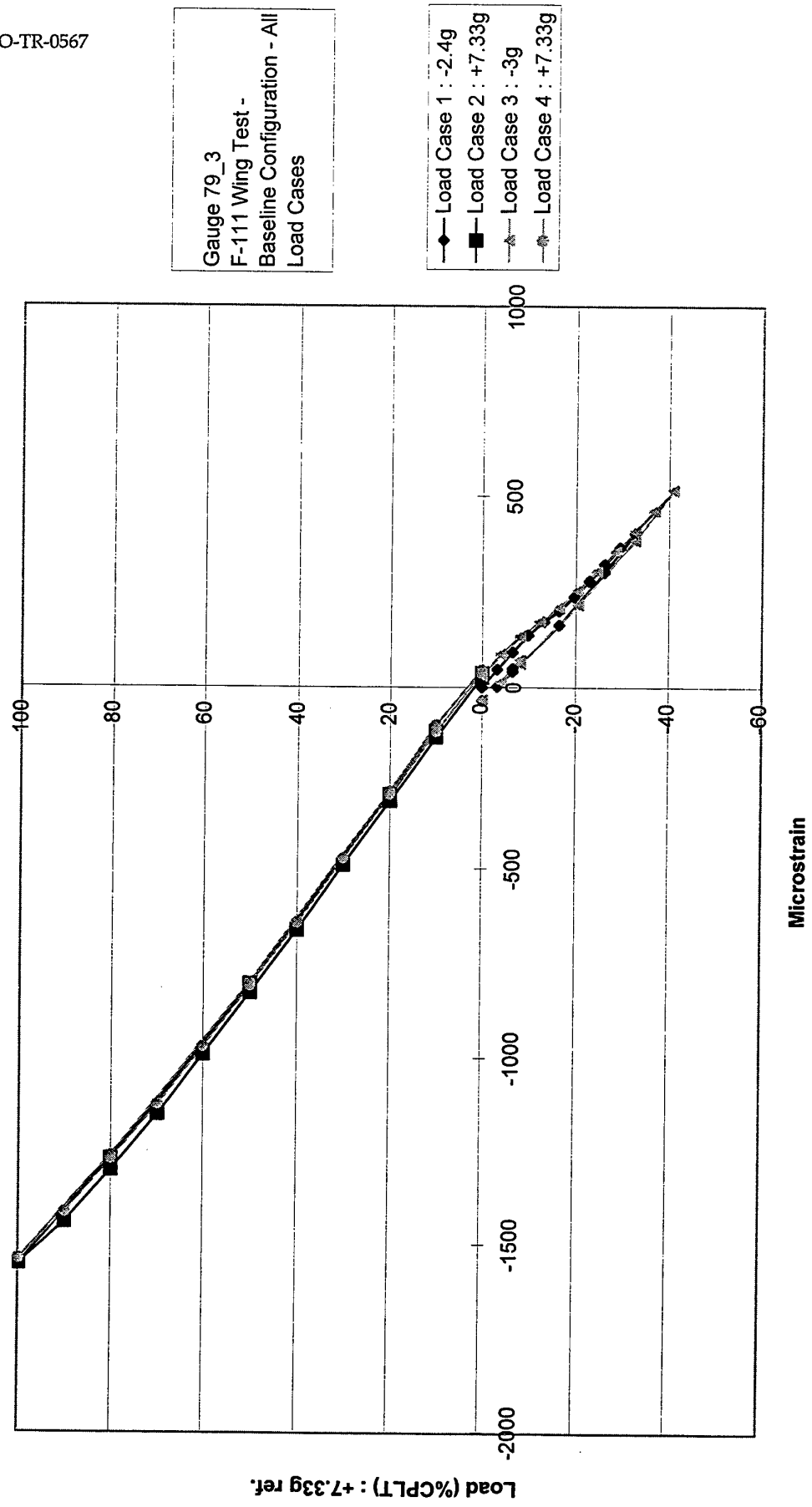

Figure C50 : Strain History For Strain Gauge Stiffener #3 - Aft Face

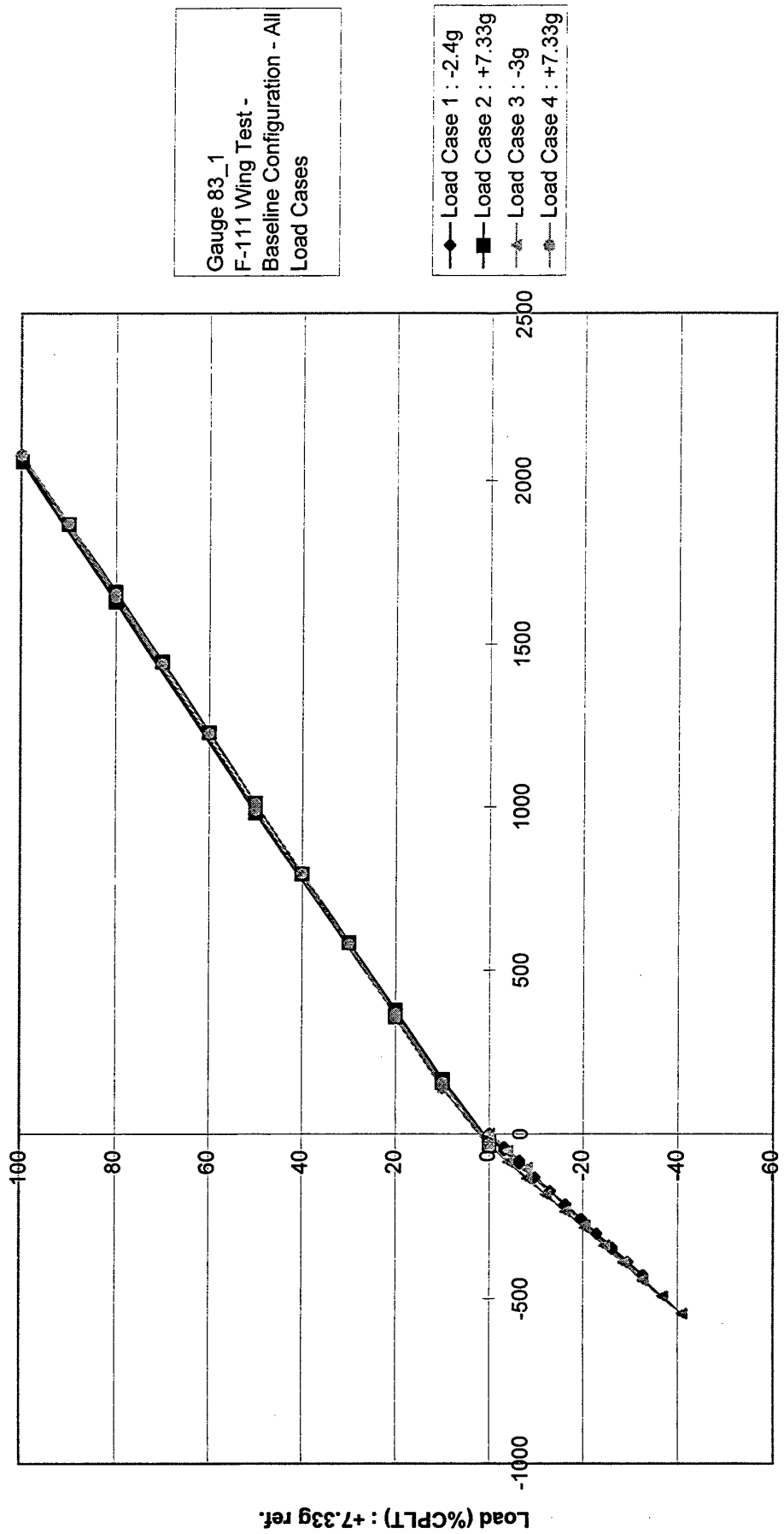

Figure C51 : Strain History For Strain Gauge Stiffener #3 - Forward Face

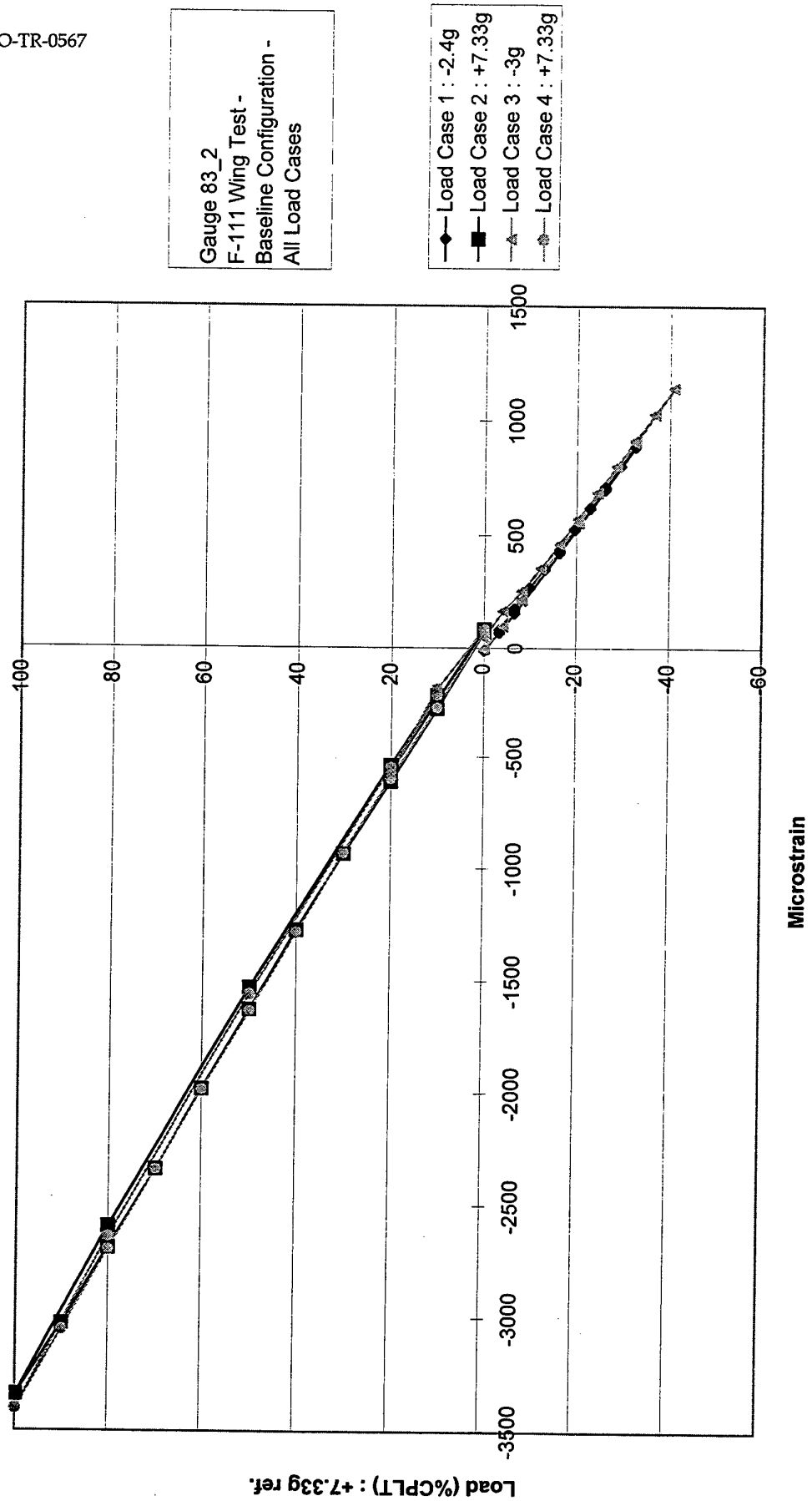

Figure C52 : Strain History For Strain Gauge Stiffener #3 - Forward Face

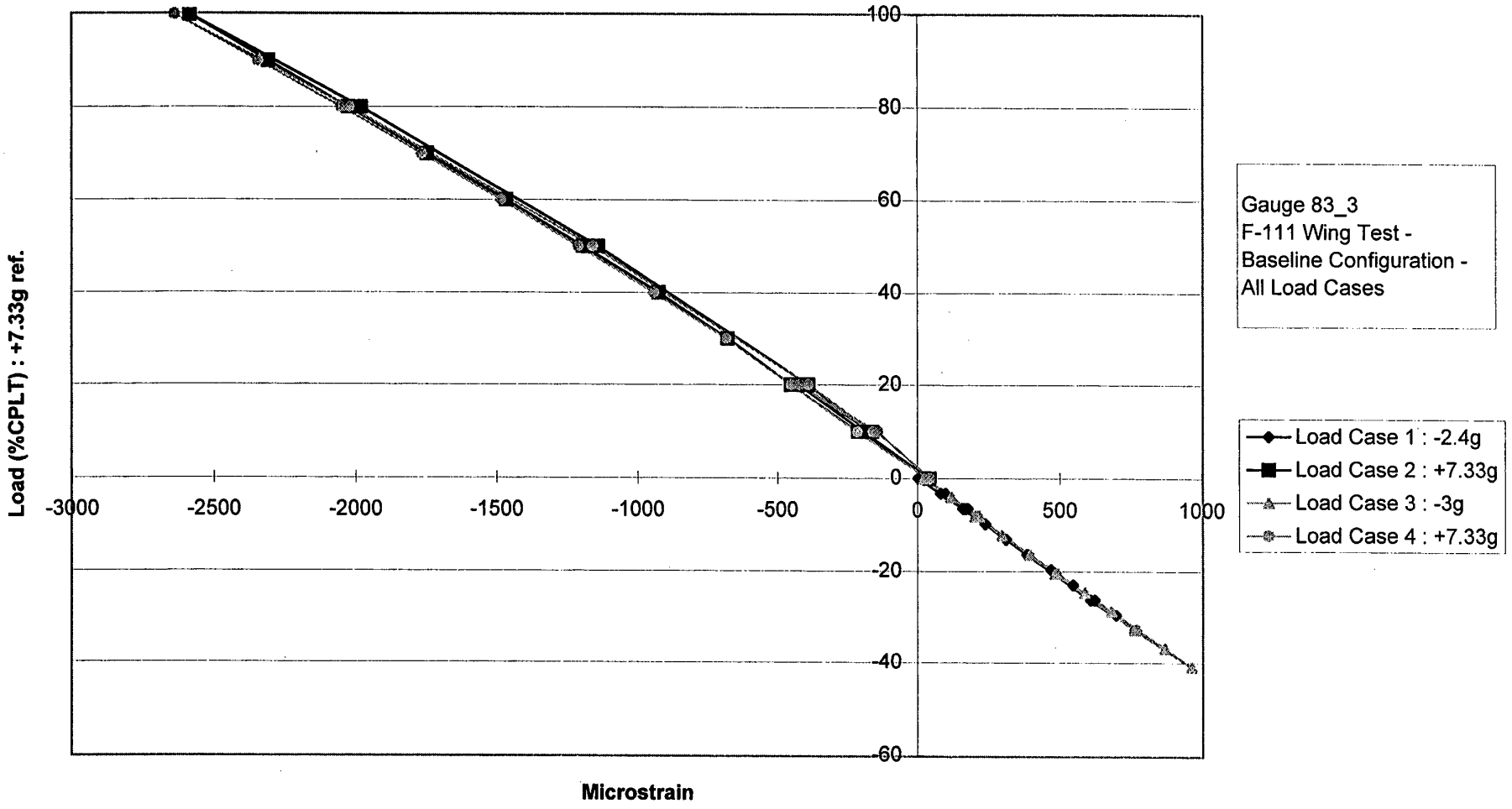

Figure C53 : Strain History For Strain Gauge Stiffener #3 - Forward Face

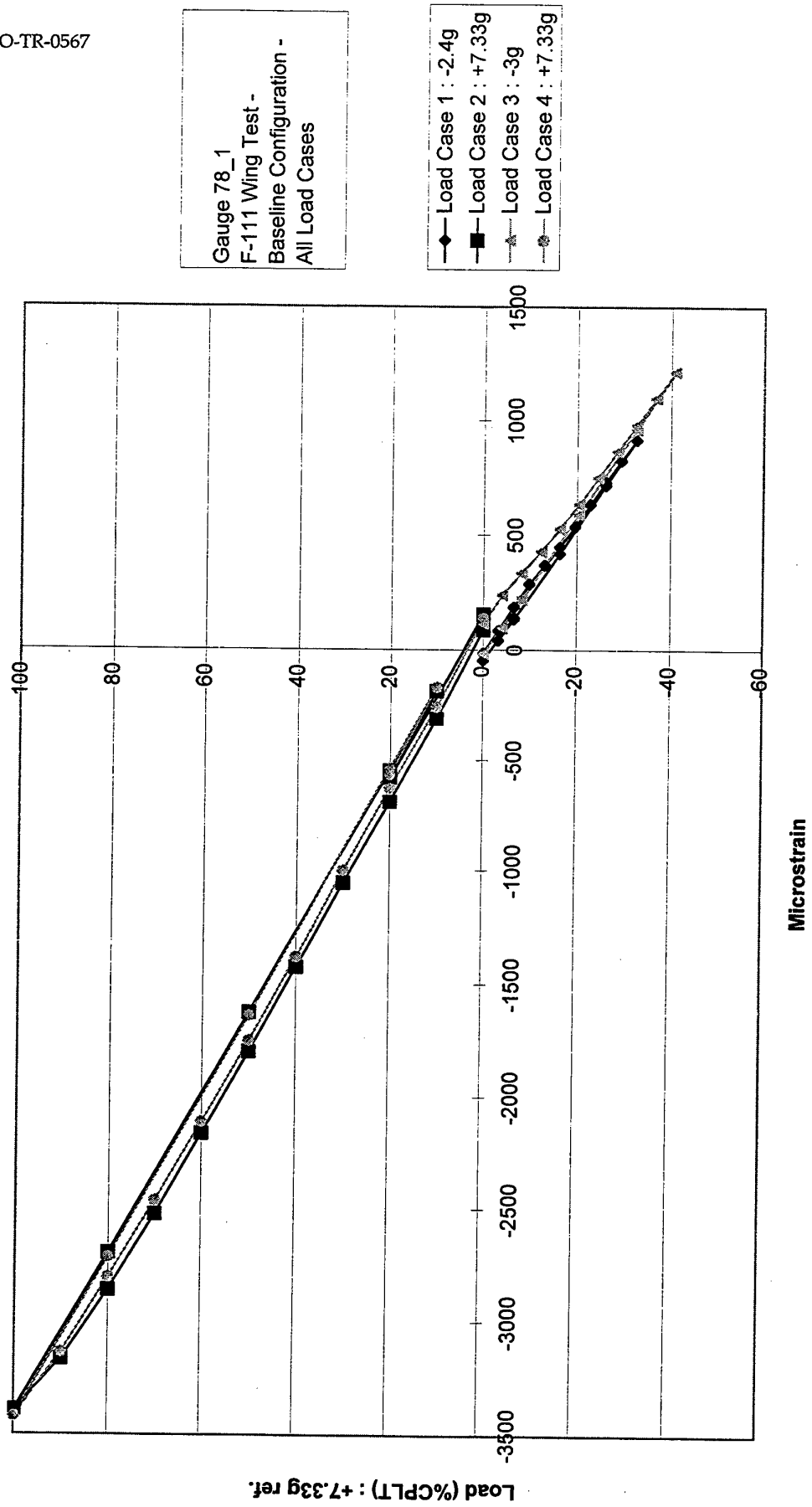

Figure C54 : Strain History For Strain Gauge Stiffener #3 - Aft Face

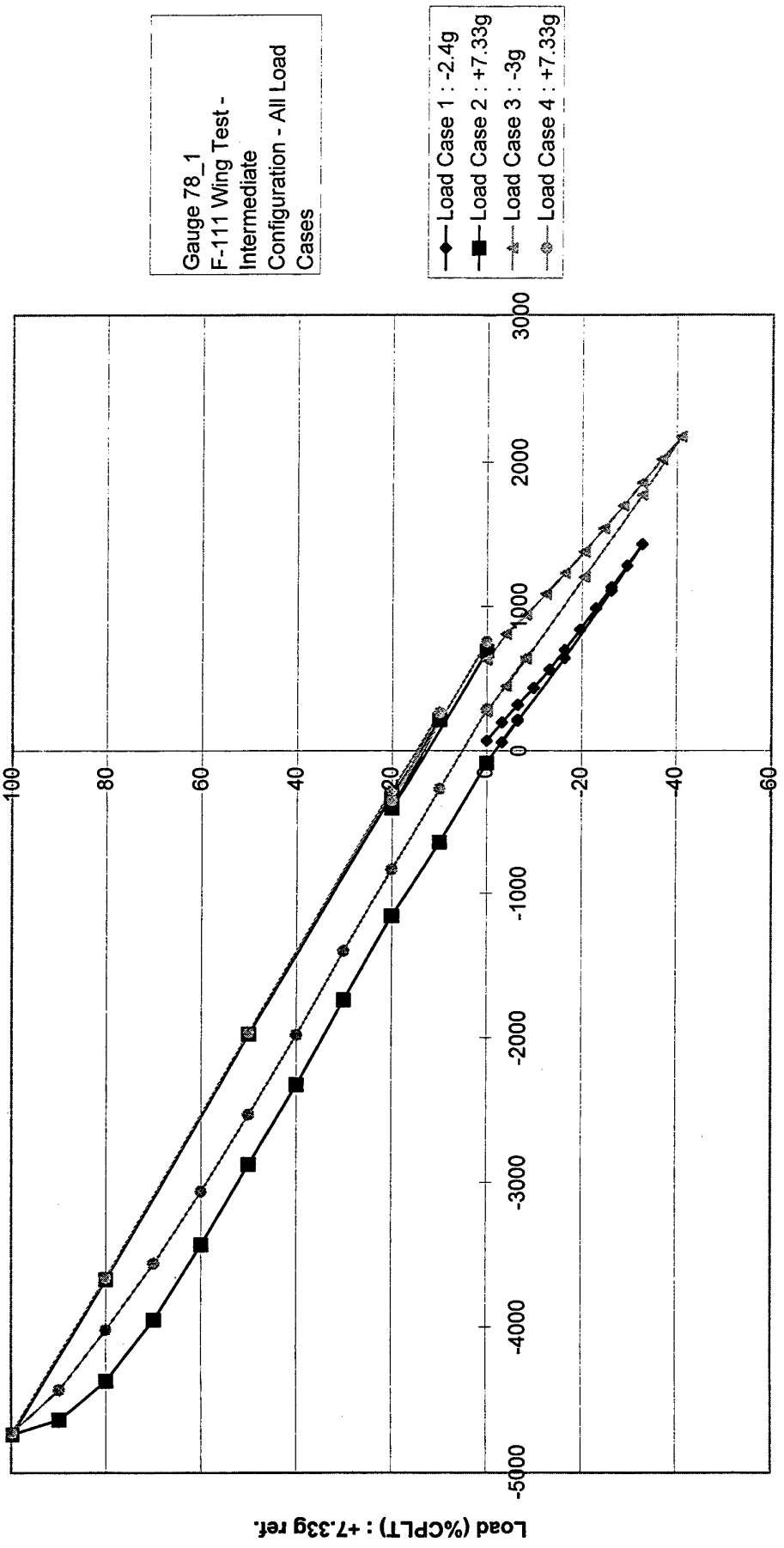

Figure C55 : Strain History For Strain Gauge Stiffener #3 - Aft Face

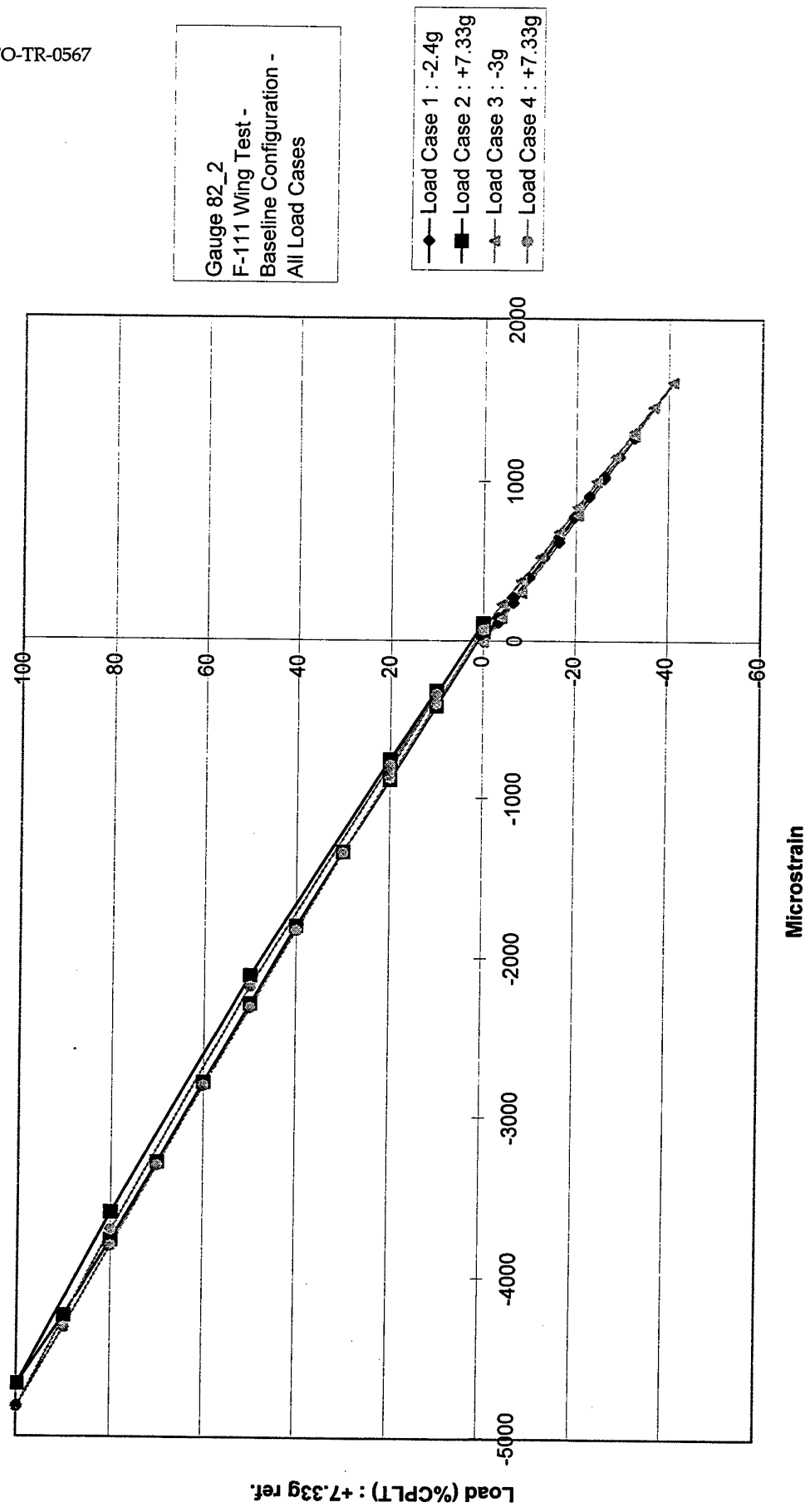

Figure C56 : Strain History For Strain Gauge Stiffener #3 - Forward Face

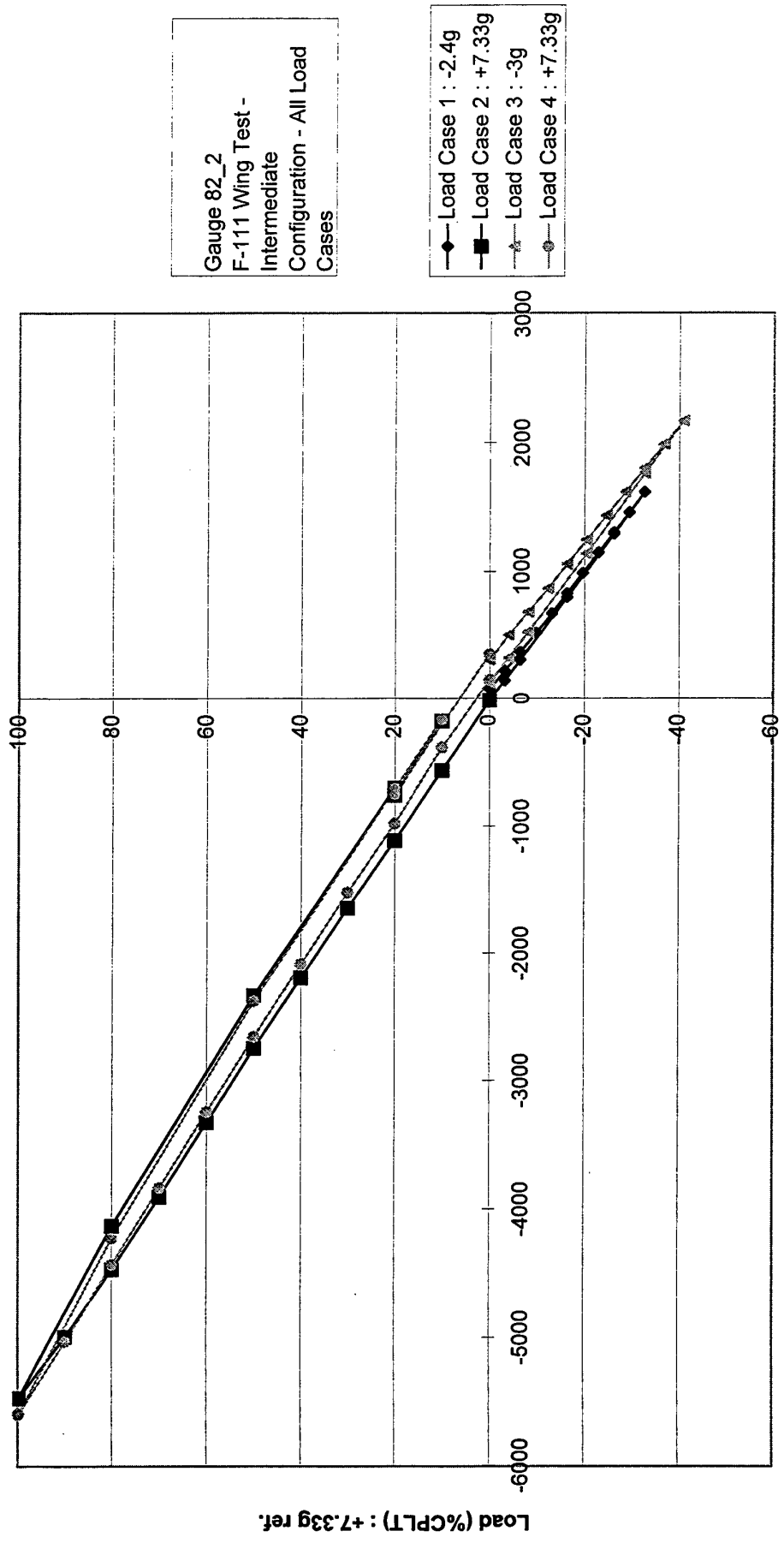

Figure C57 : Strain History For Strain Gauge Stiffener #3 - Forward Face

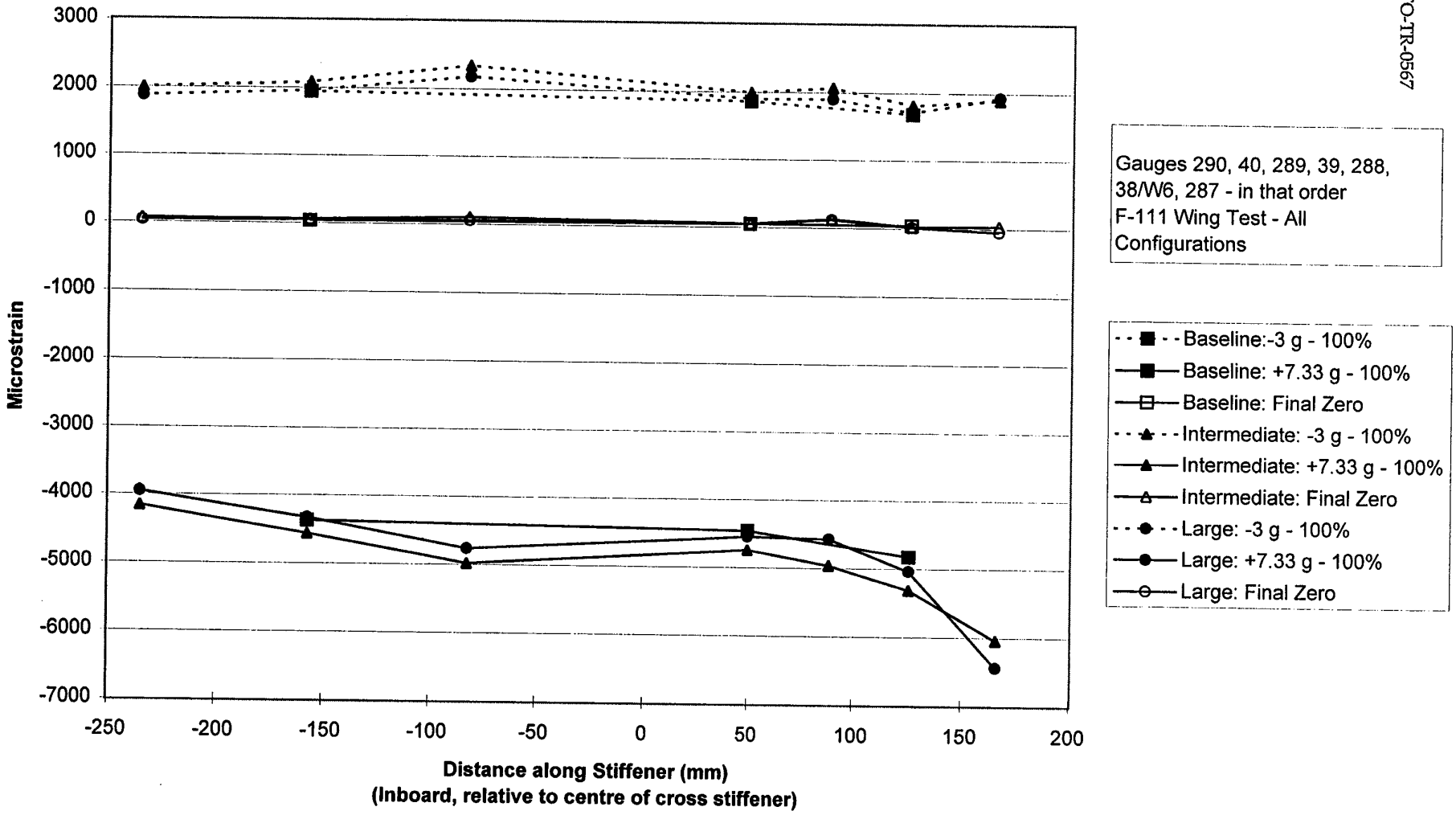

Figure C58 : Peak and Zero Strain Distribution On Outside Upper Plate Along Stiffener #3

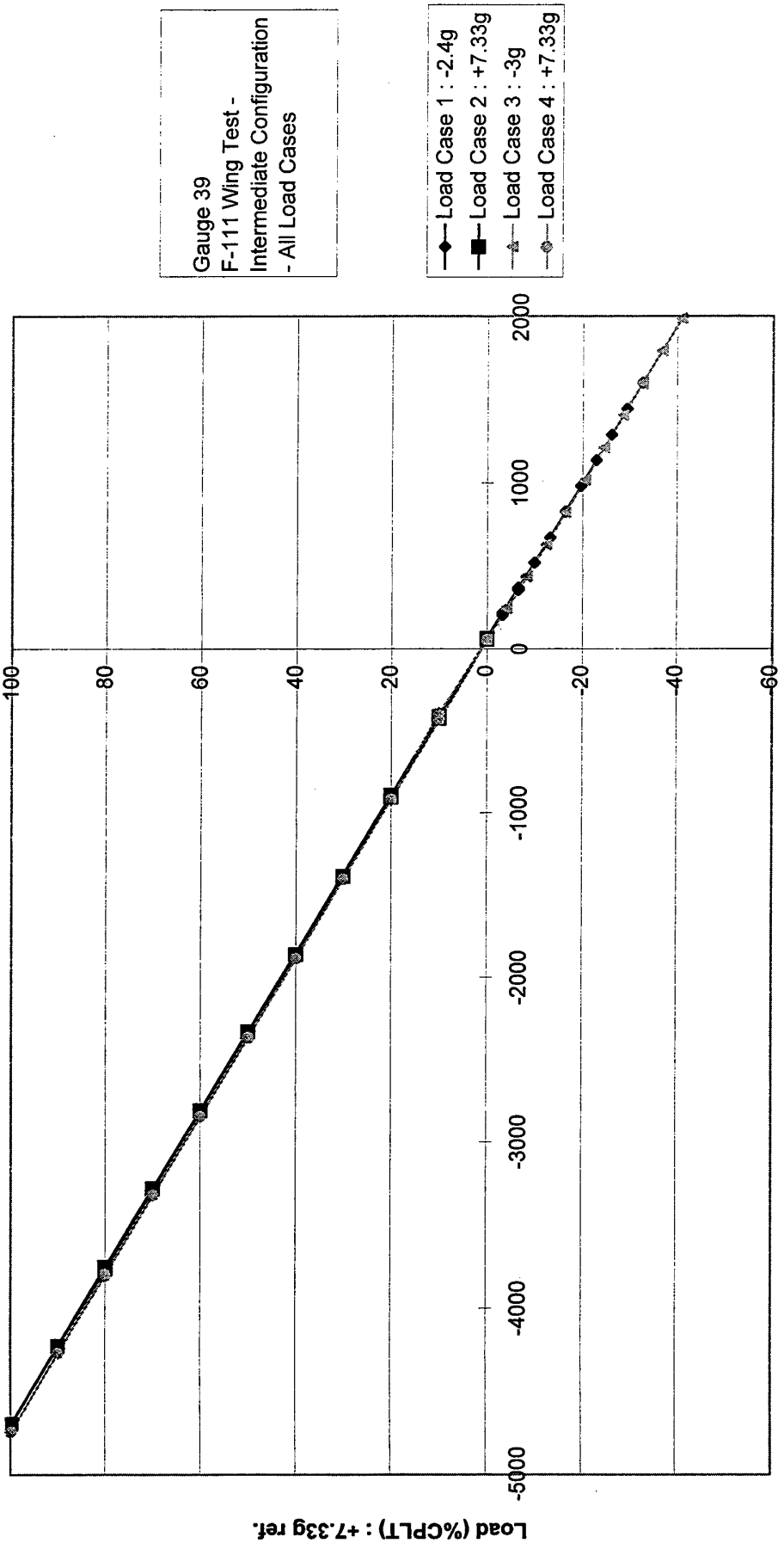

Figure C59 : Strain History For Outside Upper Plate Over Stiffener #3

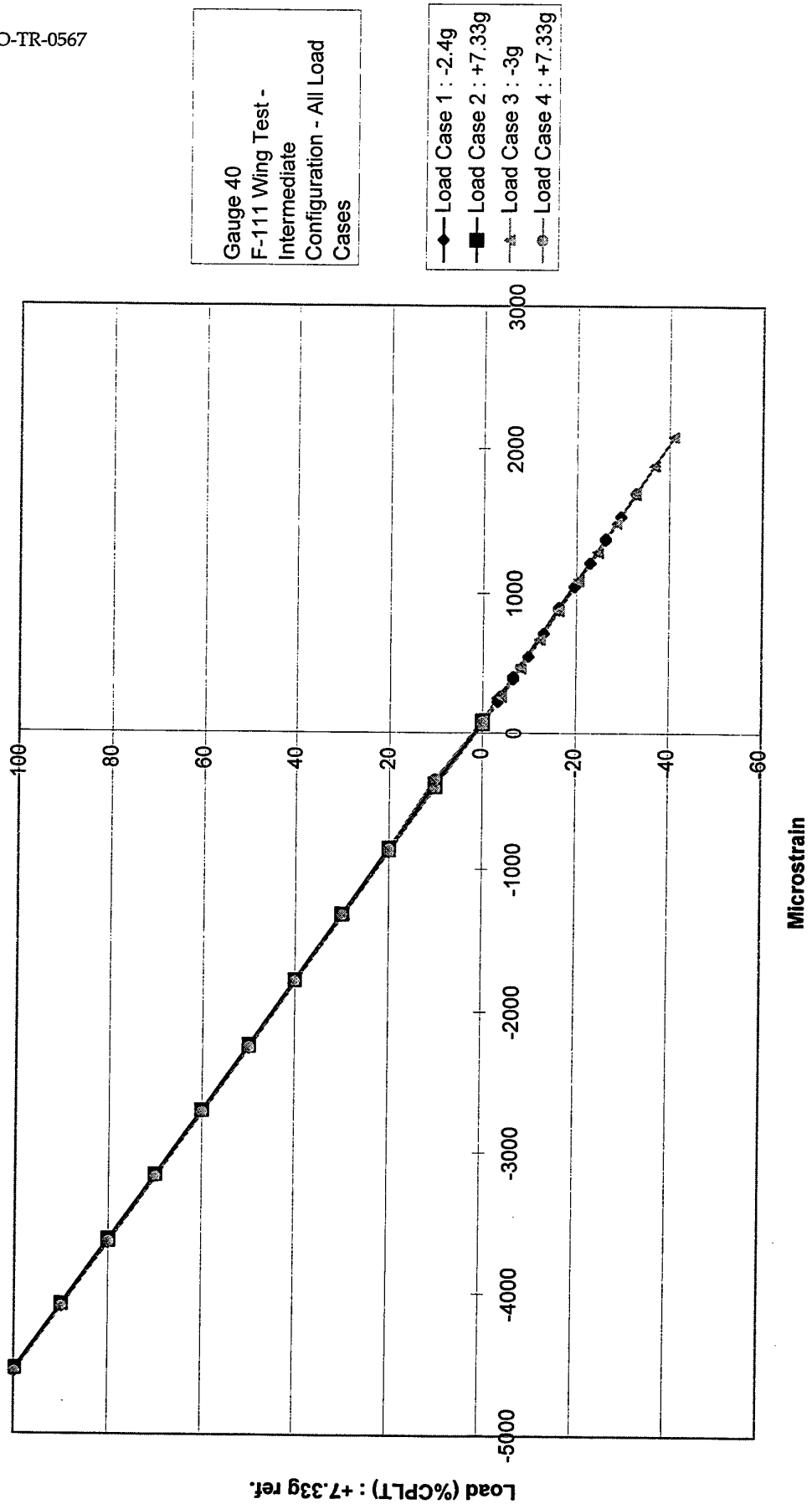

Figure C60 : Strain History For Outside Upper Plate Over Stiffener #3

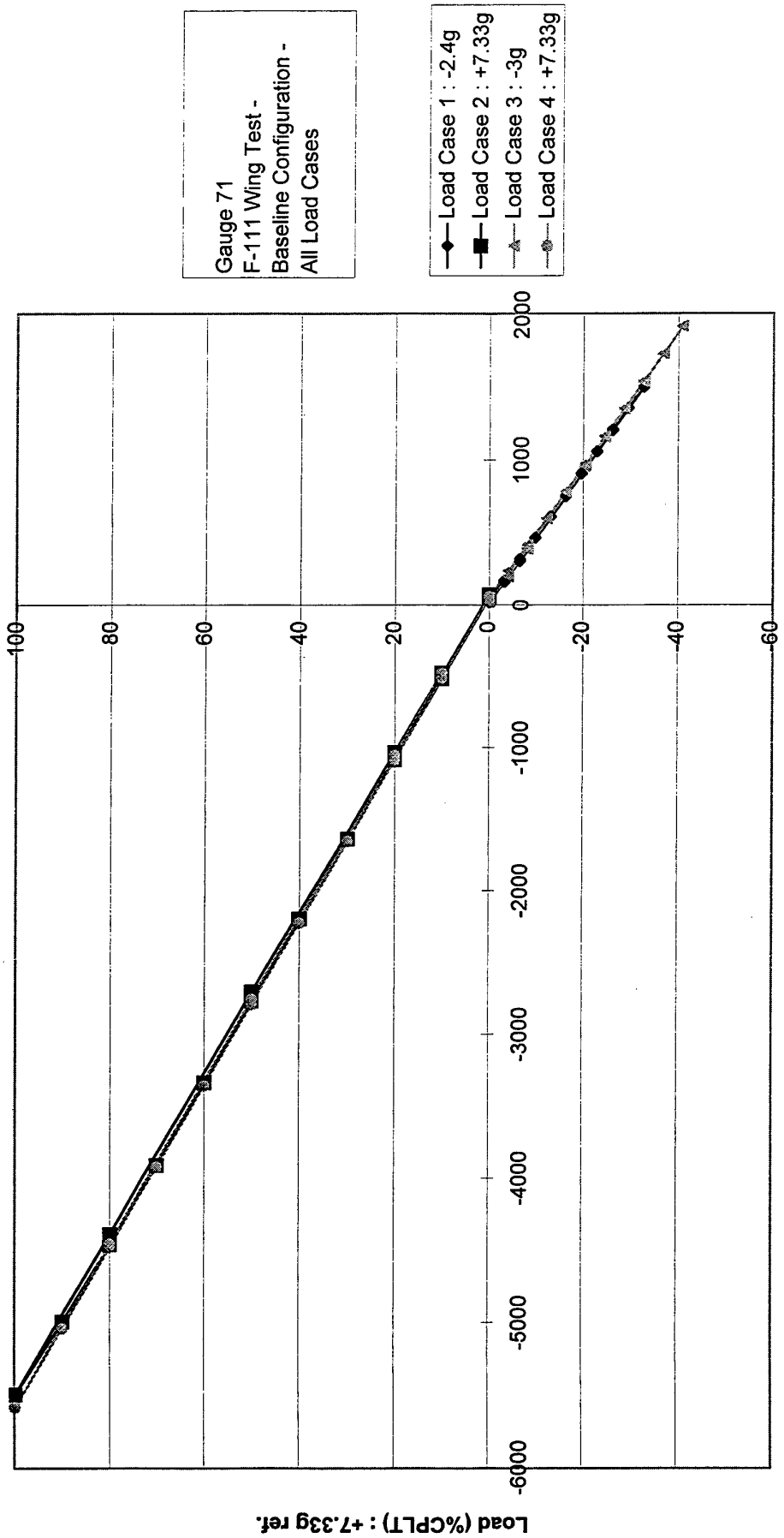

Figure C61 : Strain History For Inside Upper Plate at FFVH#13

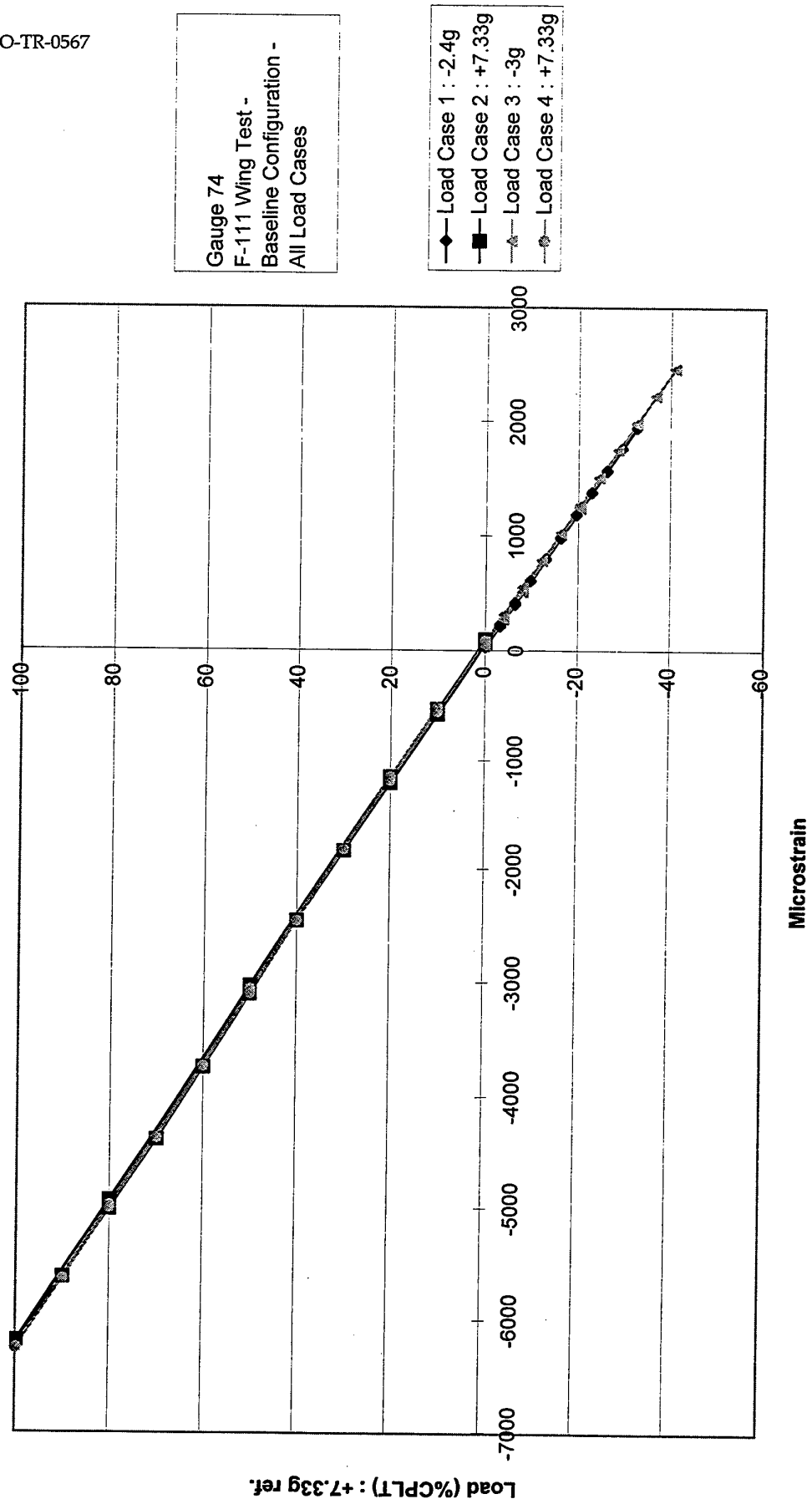

Figure C62 : Strain History For Inside Upper Plate at FFVH#14

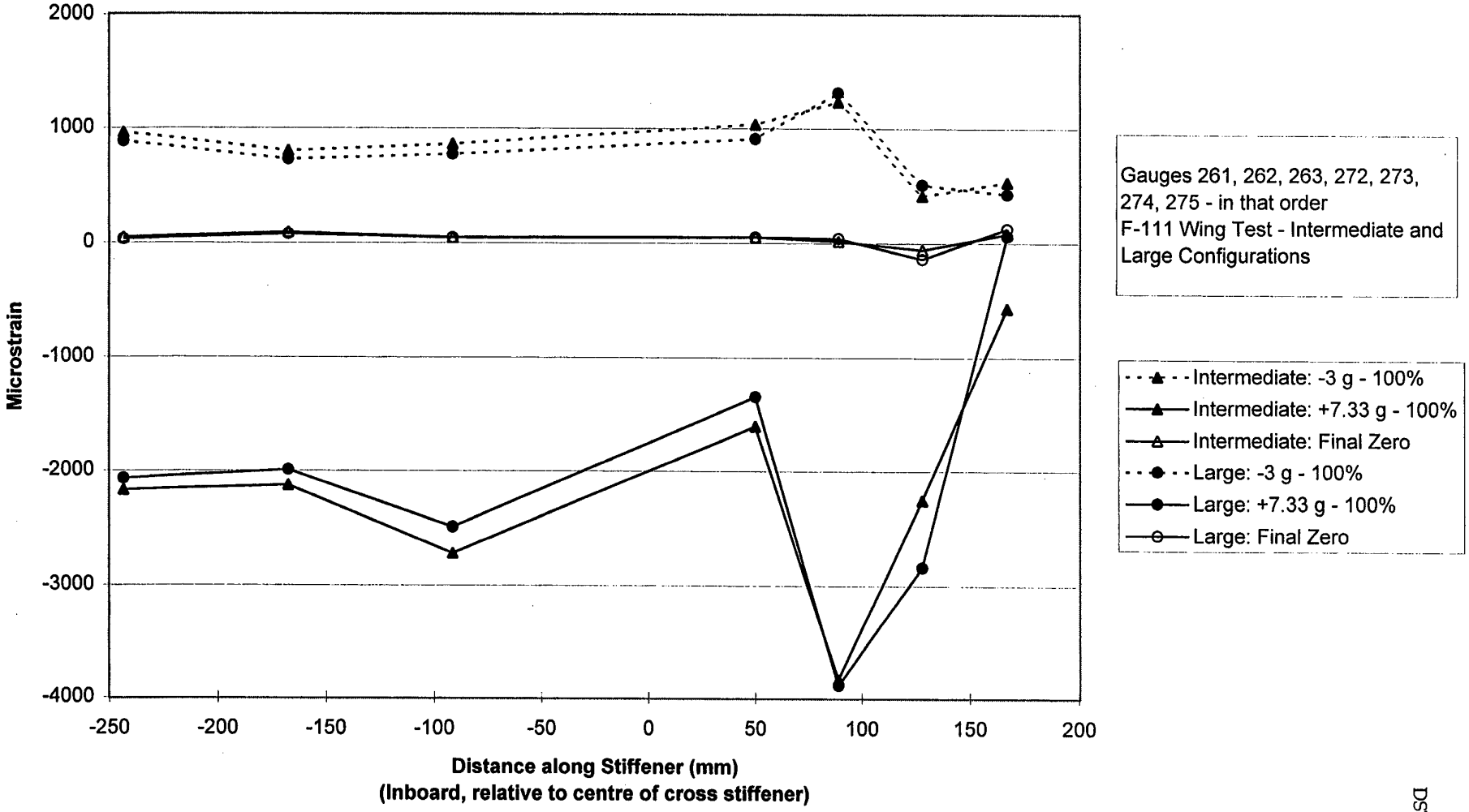

Figure C63 : Peak and Zero Strain Distribution Along Edge Of Stiffener #3

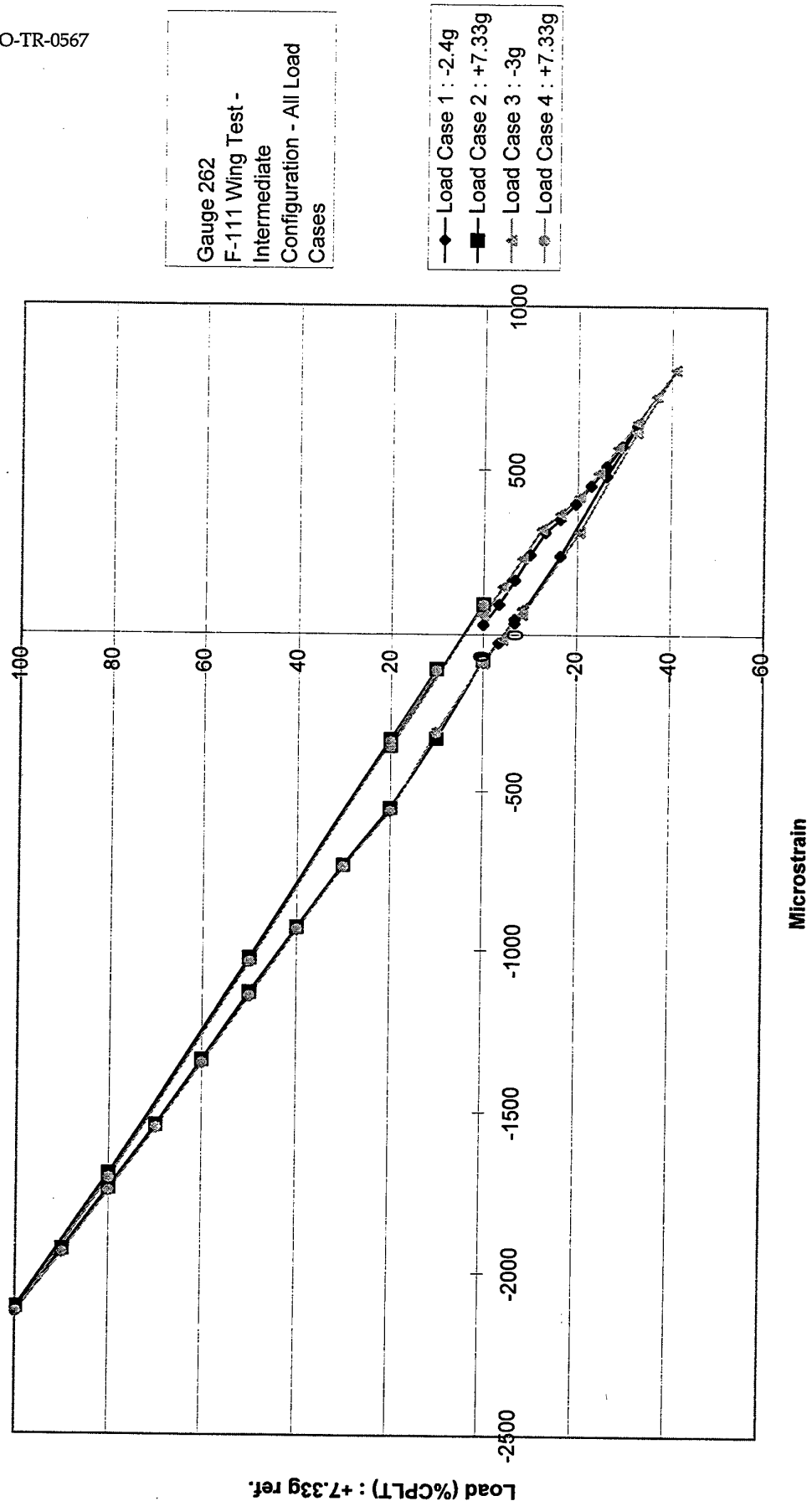

Figure C64 : Strain History For Edge Of Stiffener #3

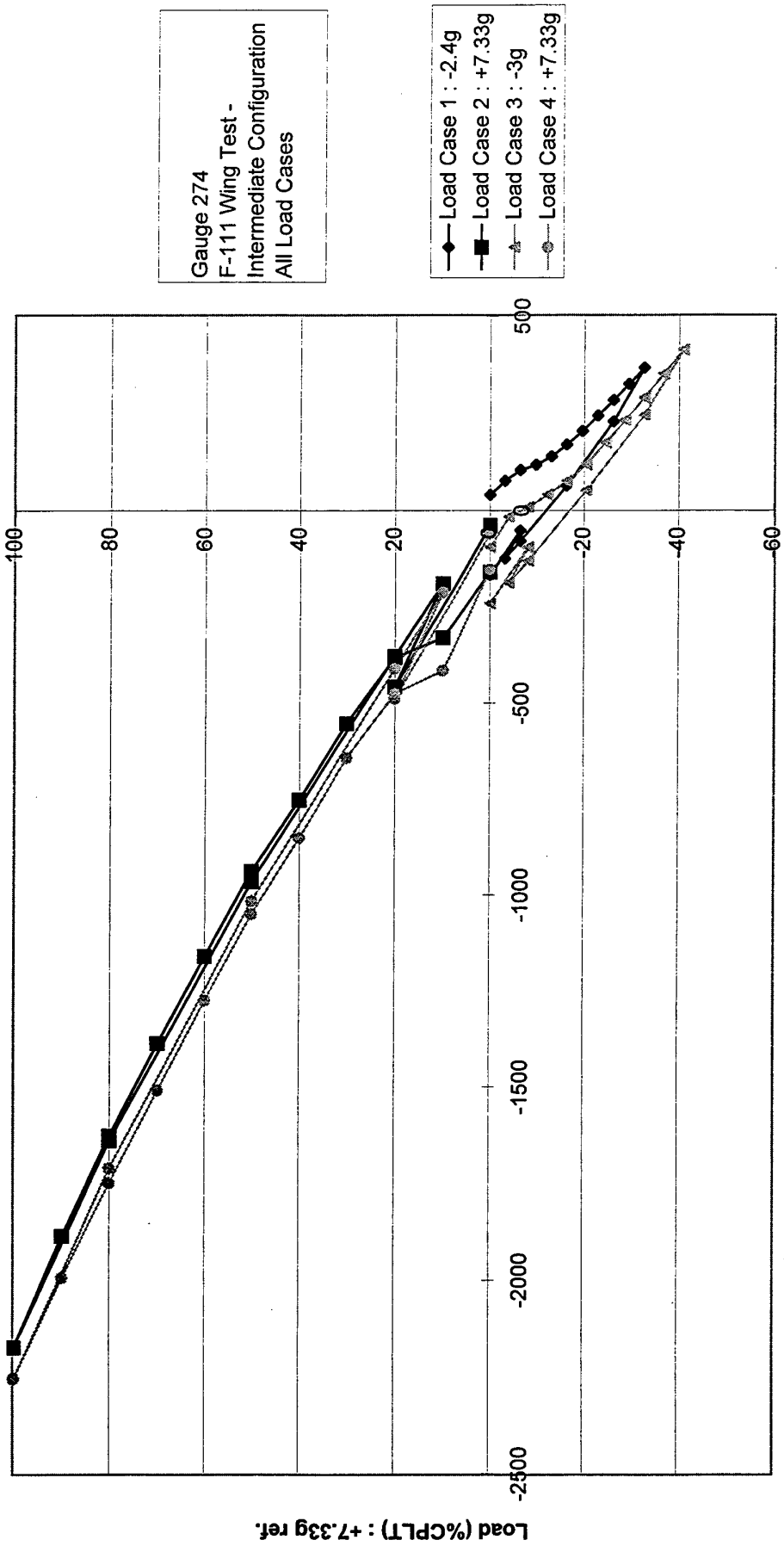

Figure C65 : Strain History For Edge Of Stiffener #3

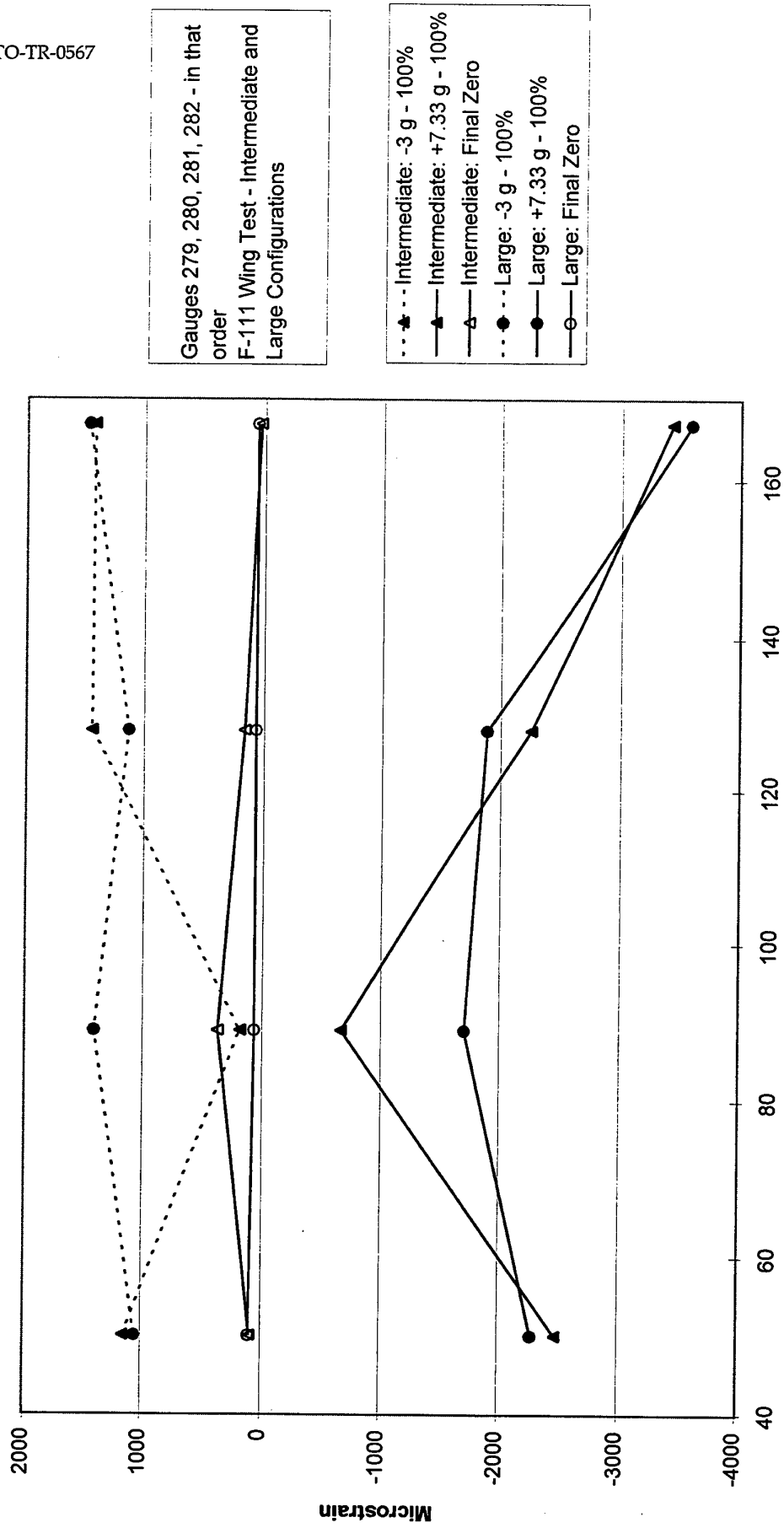

Figure C66 : Peak and Zero Strain Dist'n Along Edge Of Web Attached To Stiffener #3, Upper Plate

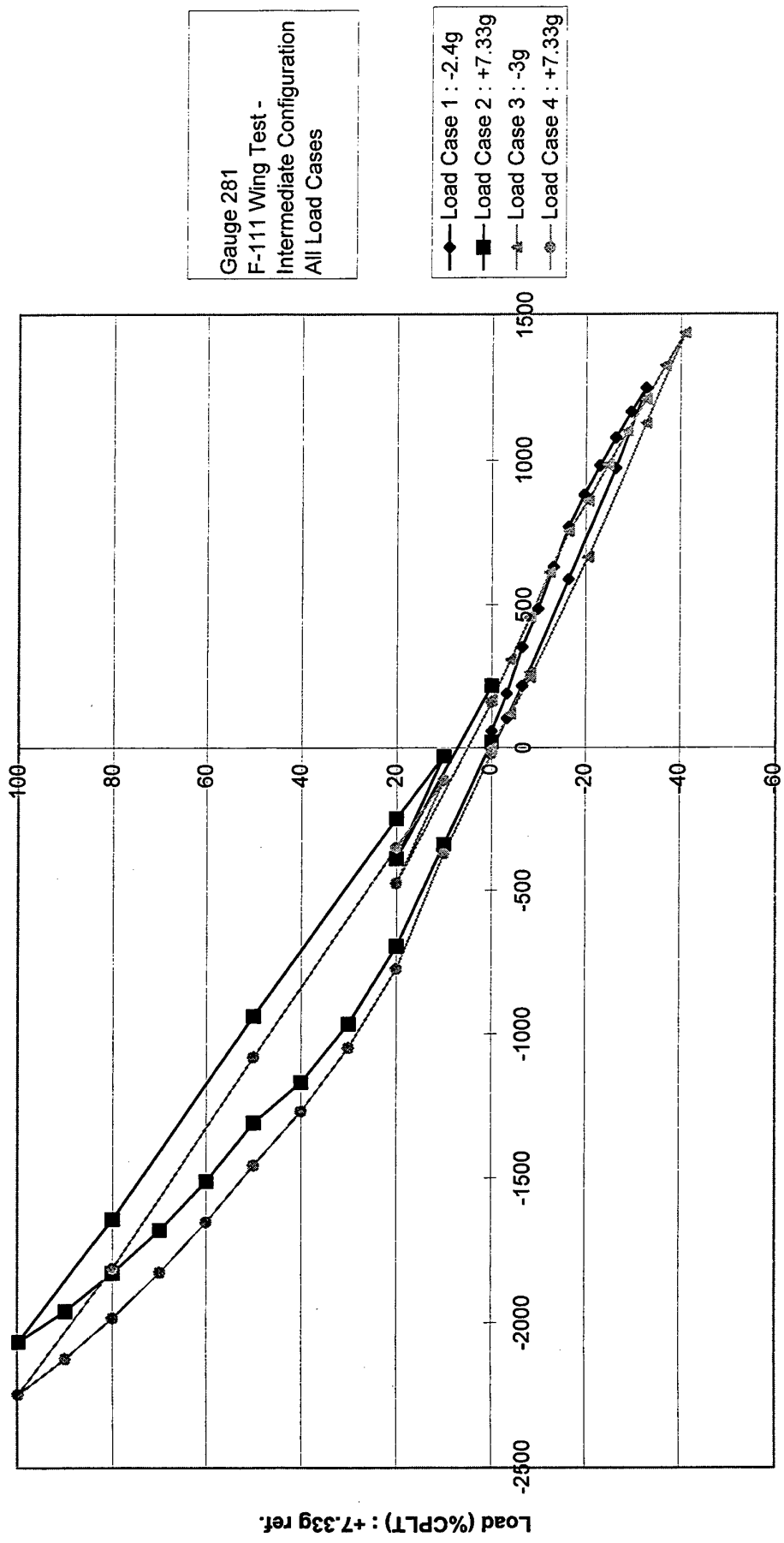

Figure C67 : Strain History For Edge Of Web At Stiffener #3

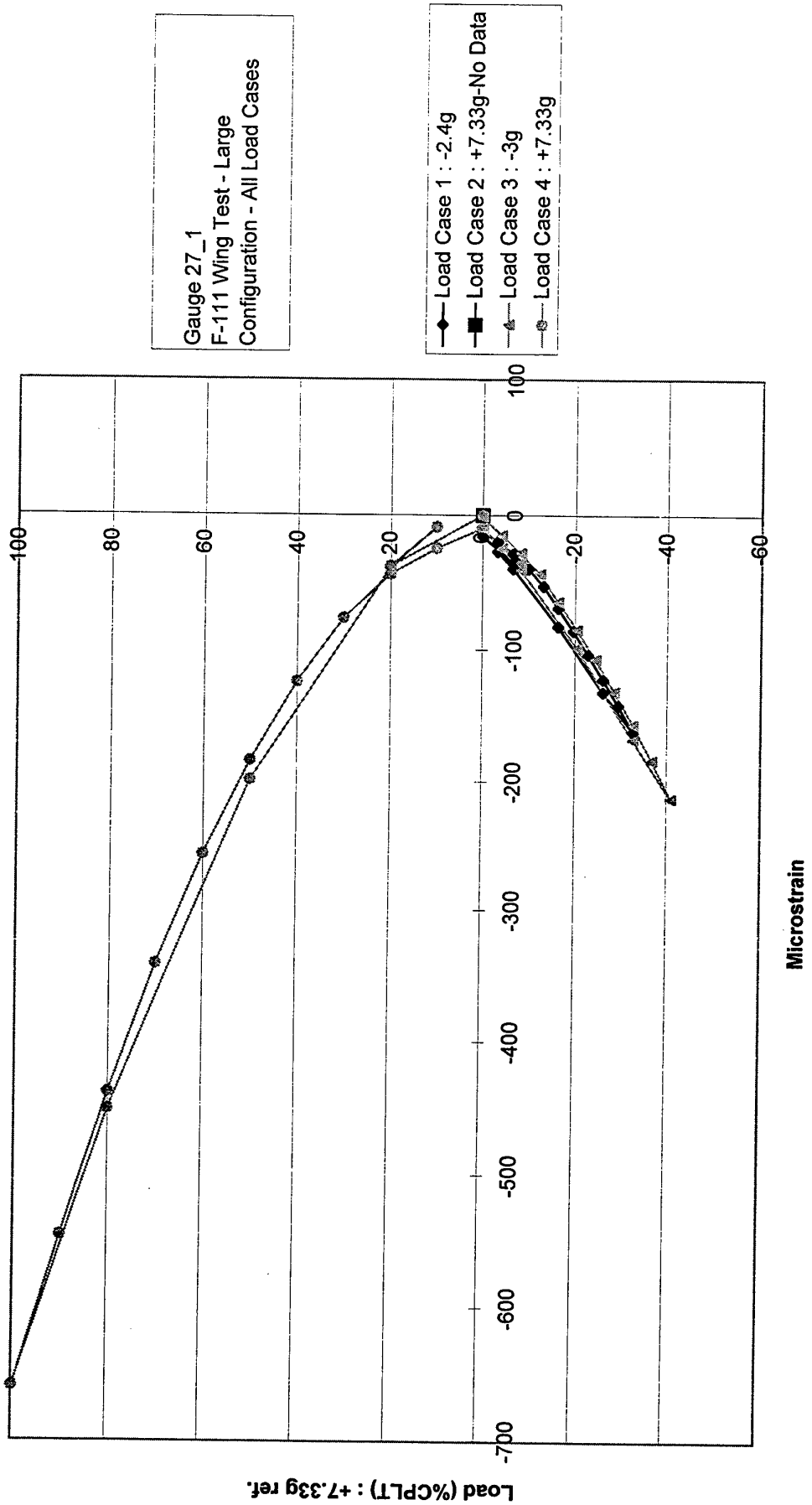

Figure C68 : Strain History For Shear Web - Aft Face

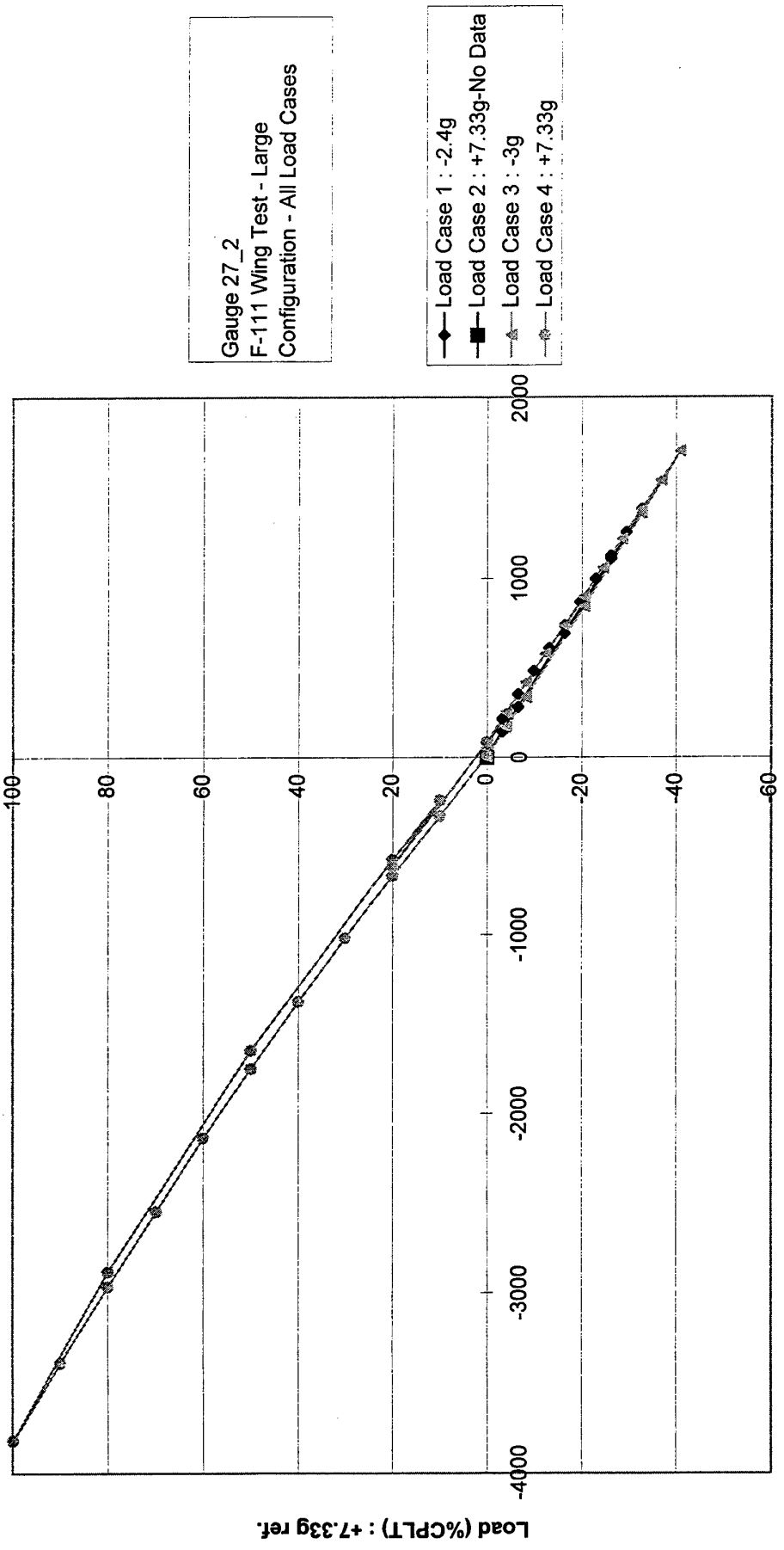

Figure C69 : Strain History For Shear Web - Aft Face

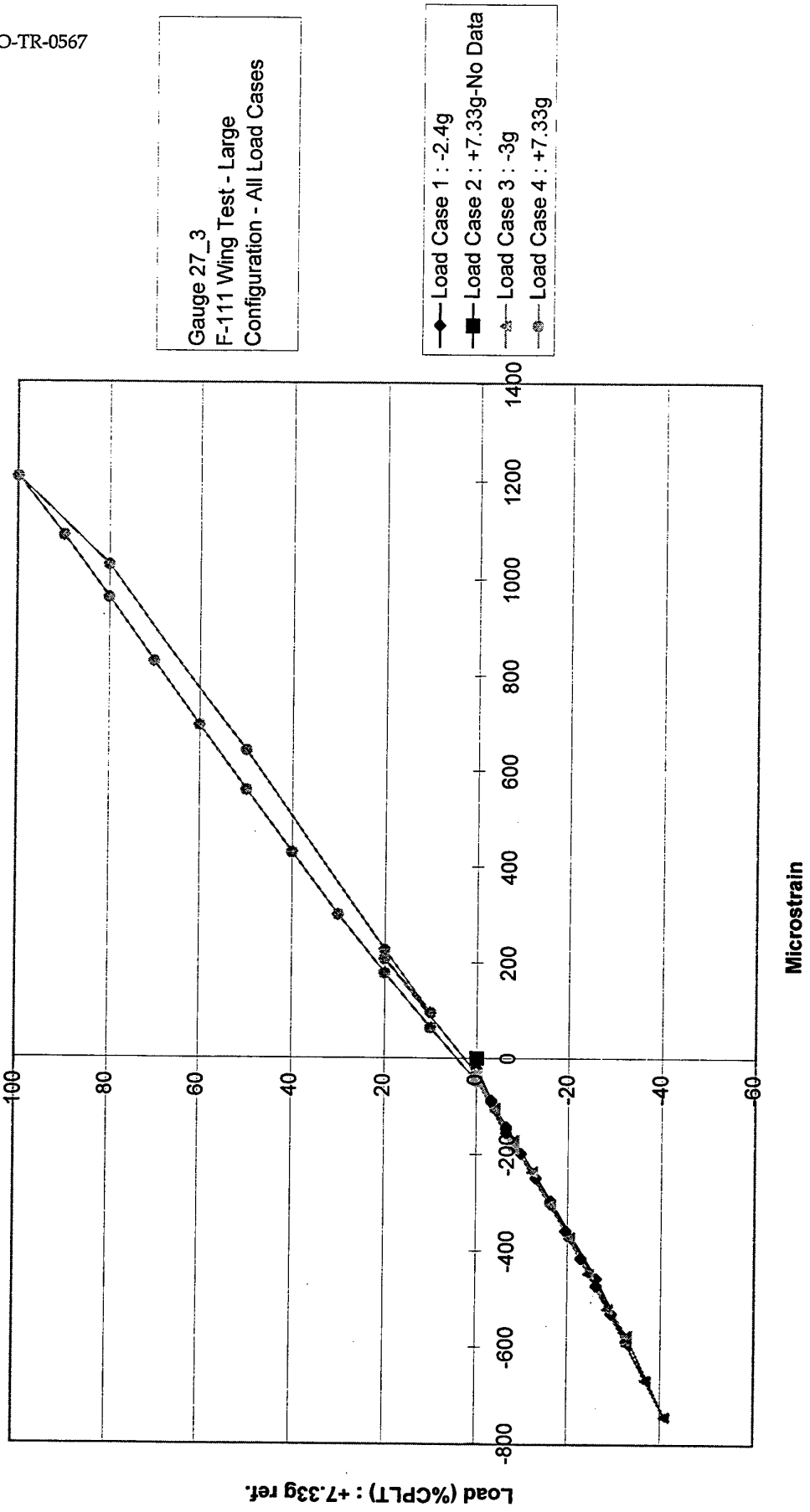

Figure C70 : Strain History For Shear Web - Aft Face

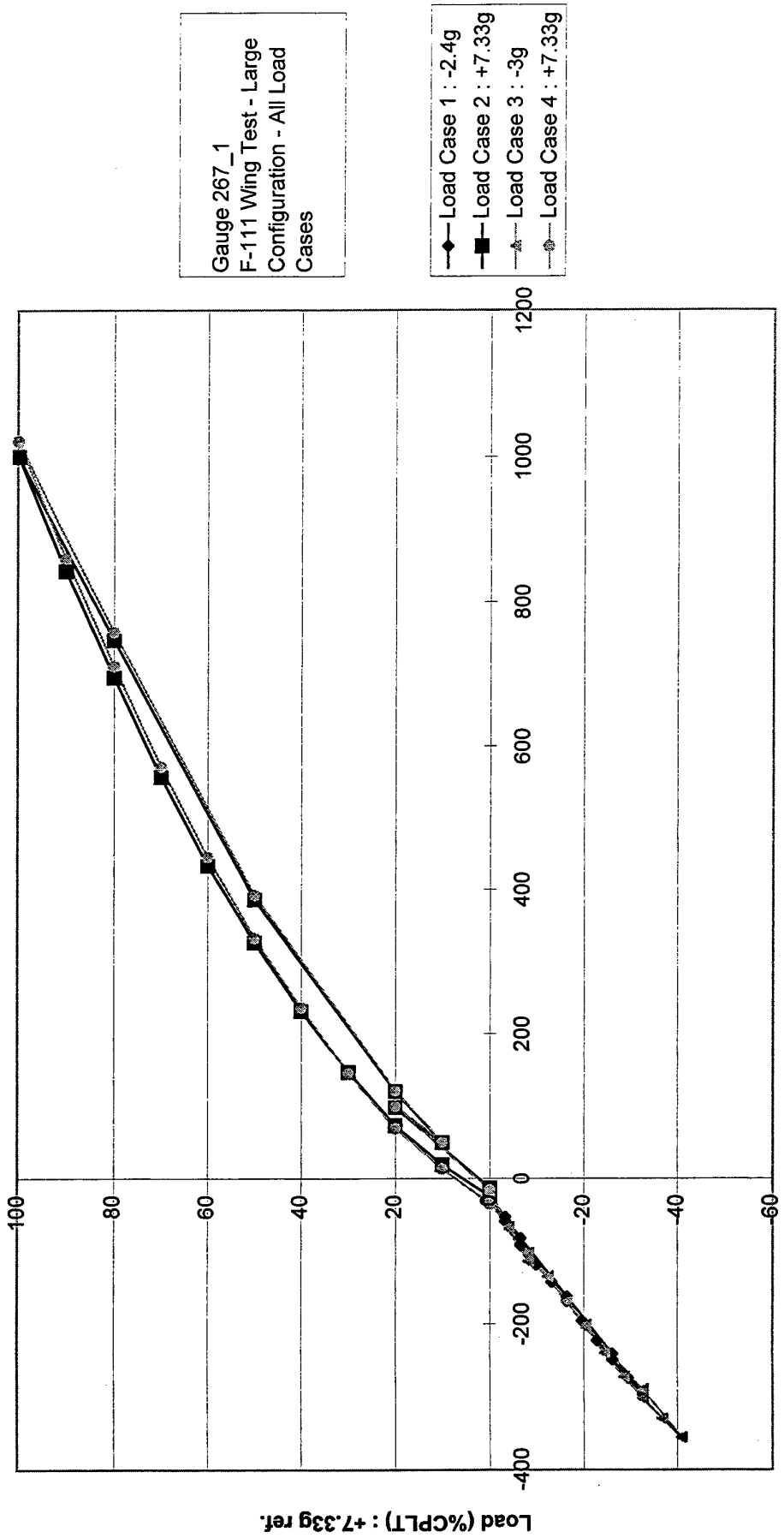

Figure C71 : Strain History For Shear Web - Forward Face

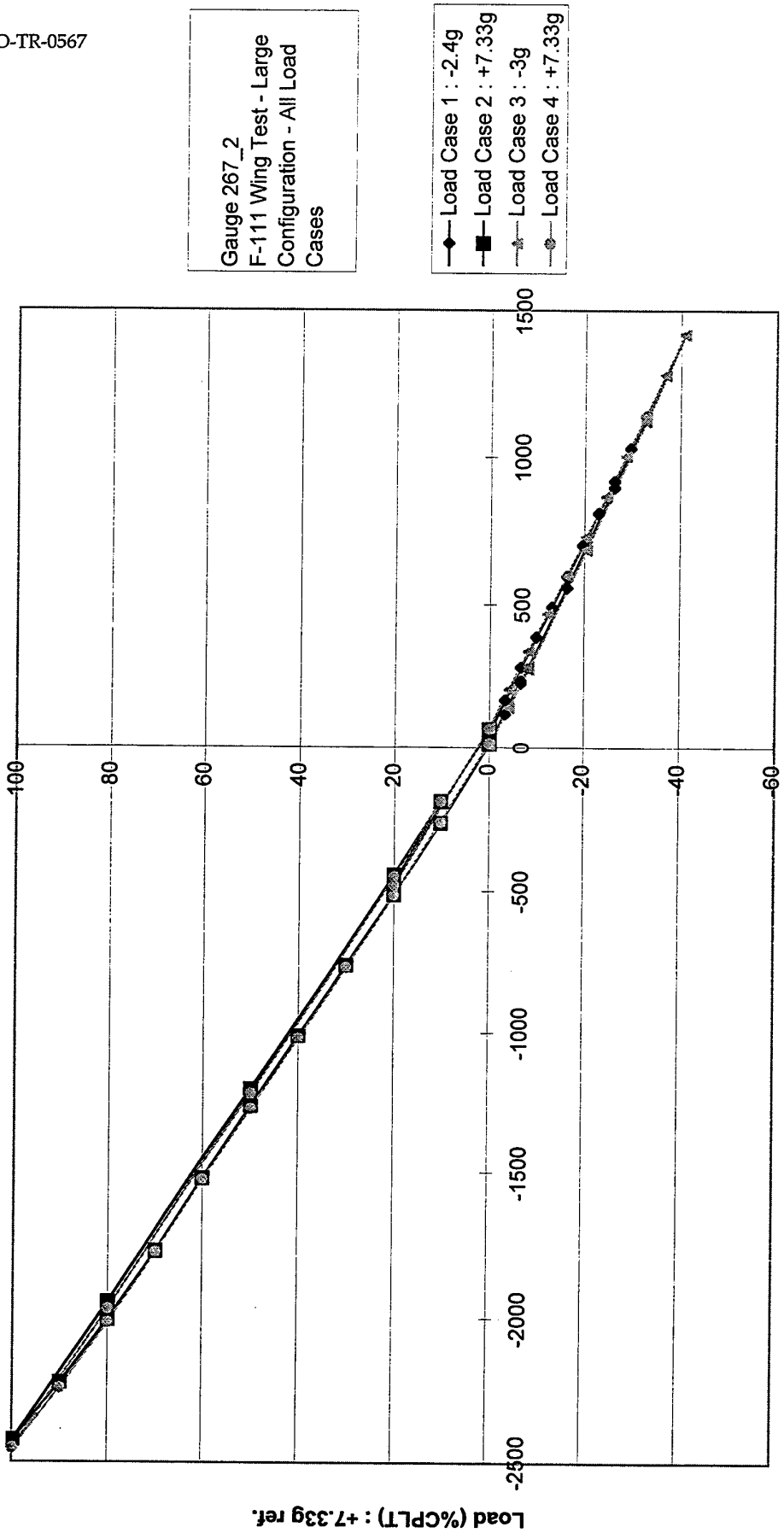

Figure C72 : Strain History For Shear Web - Forward Face

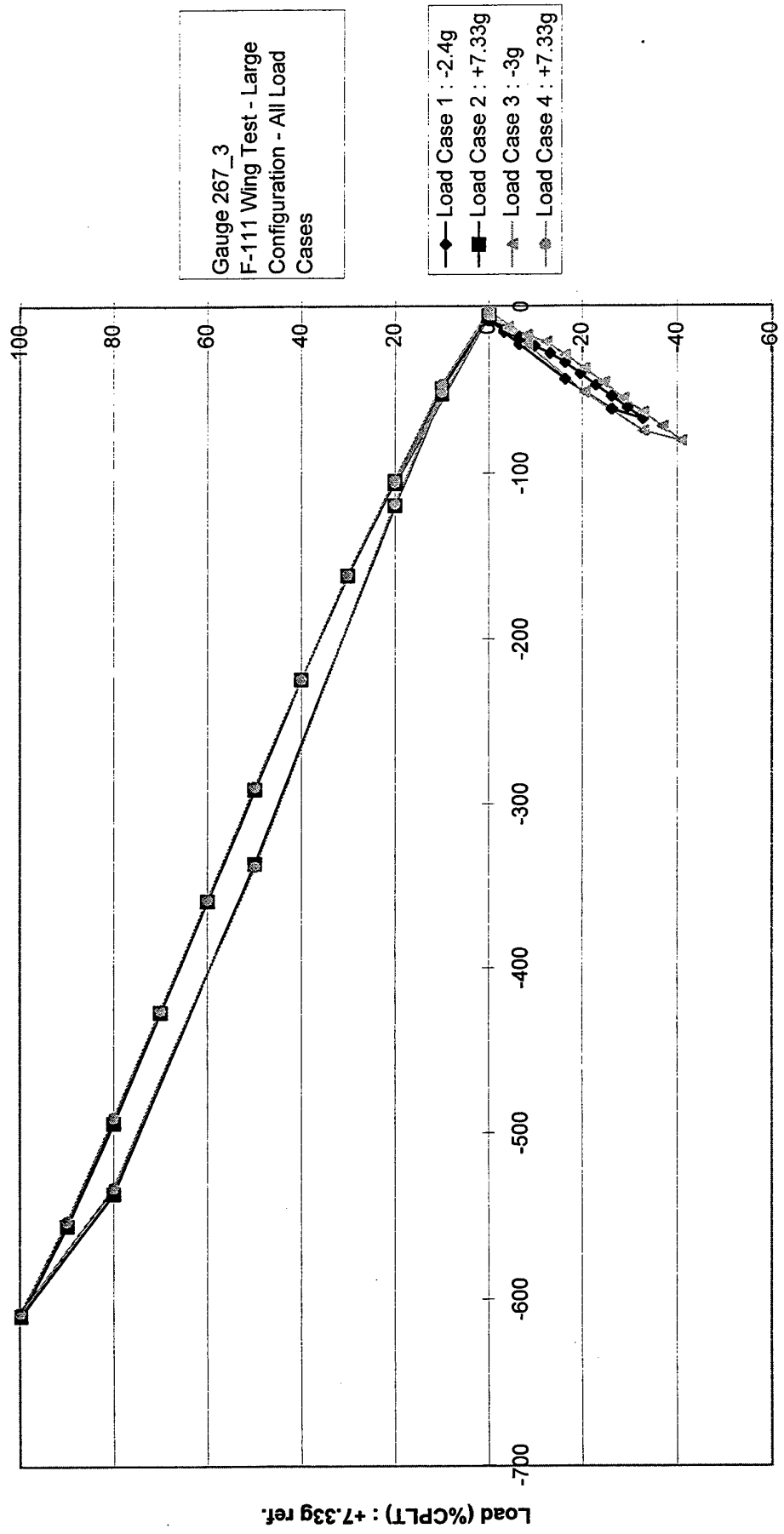

Figure C73 : Strain History For Shear Web - Forward Face

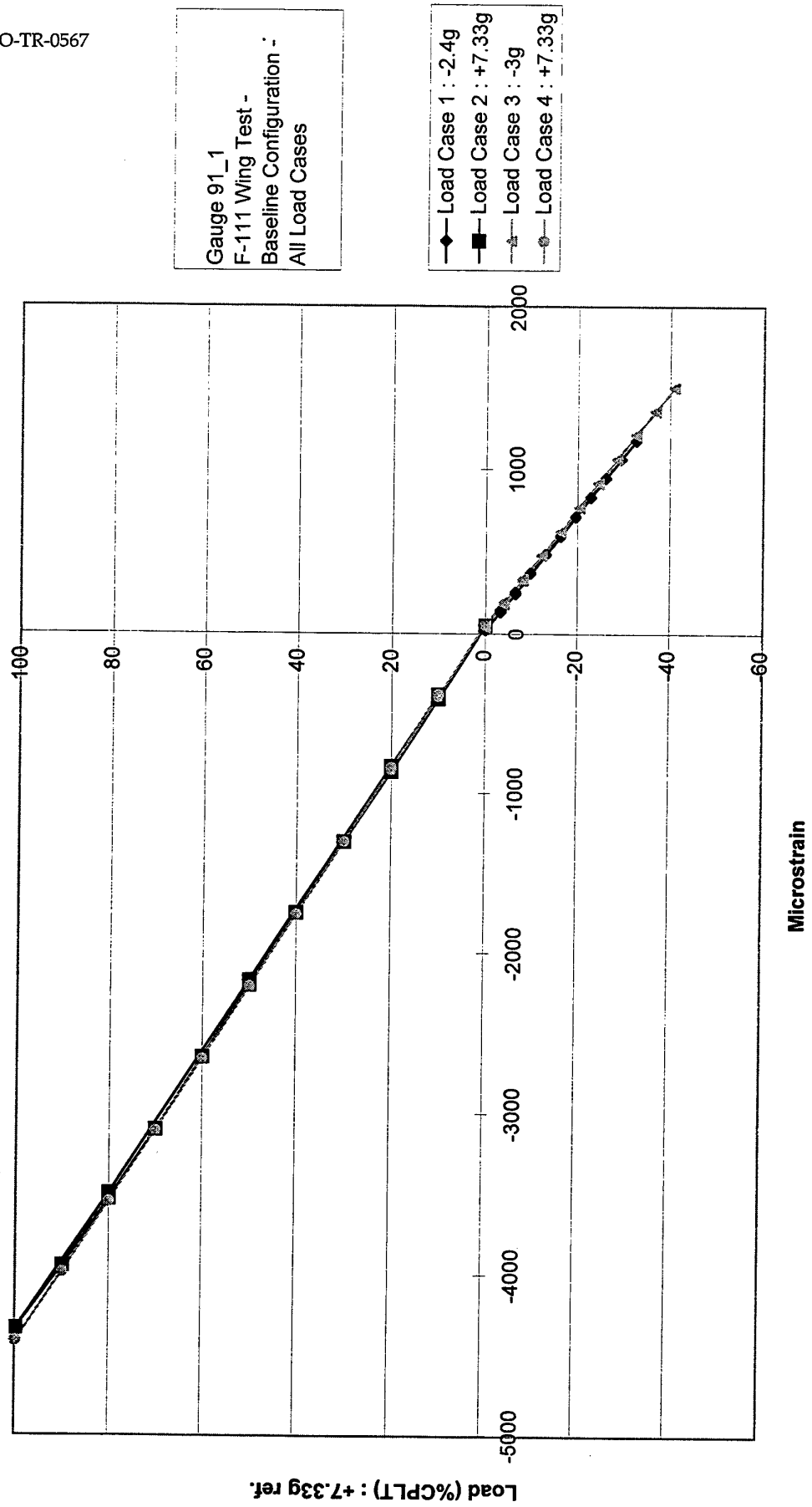

Figure C74 : Strain History For Inside Upper Plate - Mid Bay

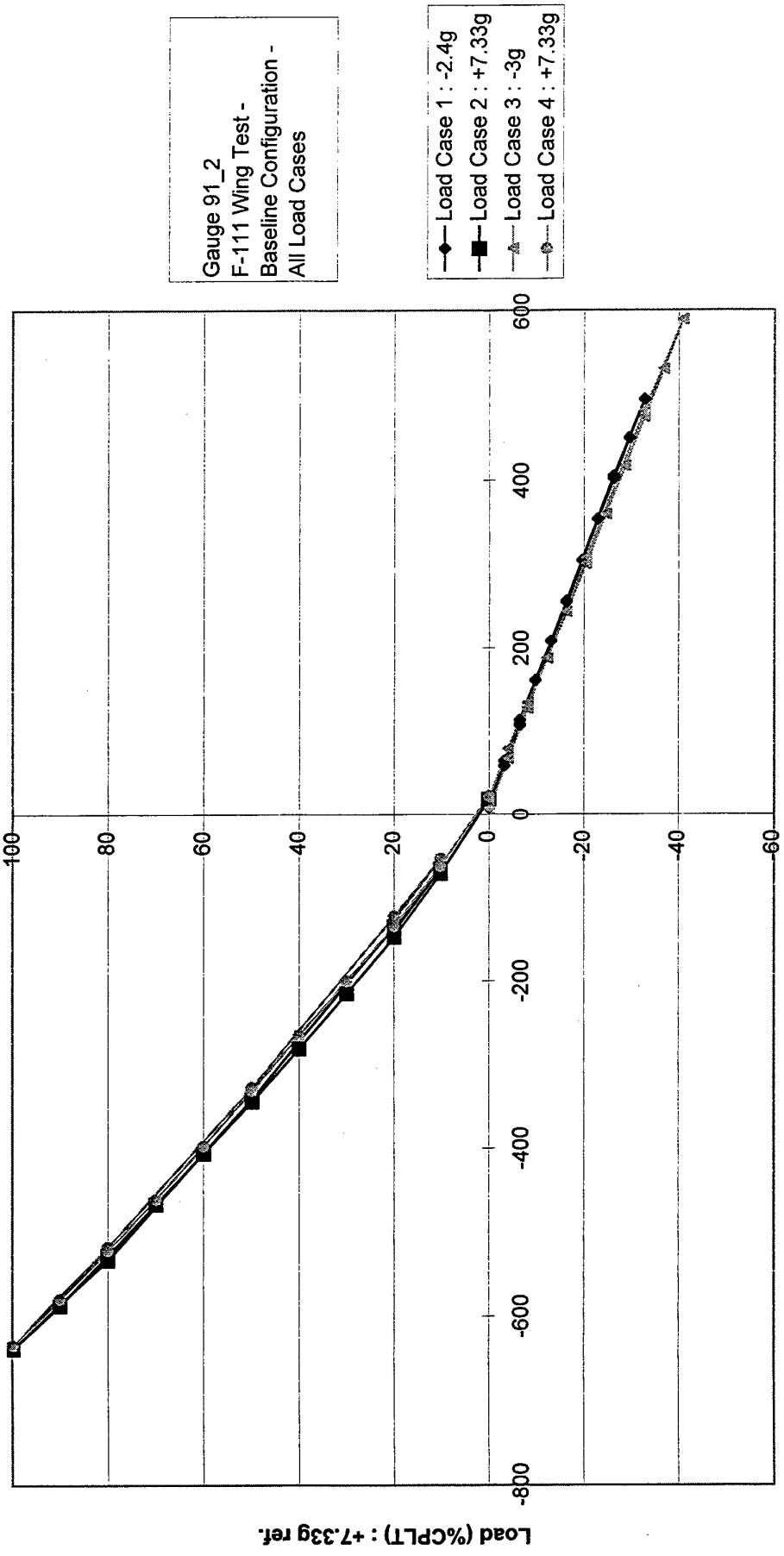

Figure C75 : Strain History For Inside Upper Plate - Mid Bay

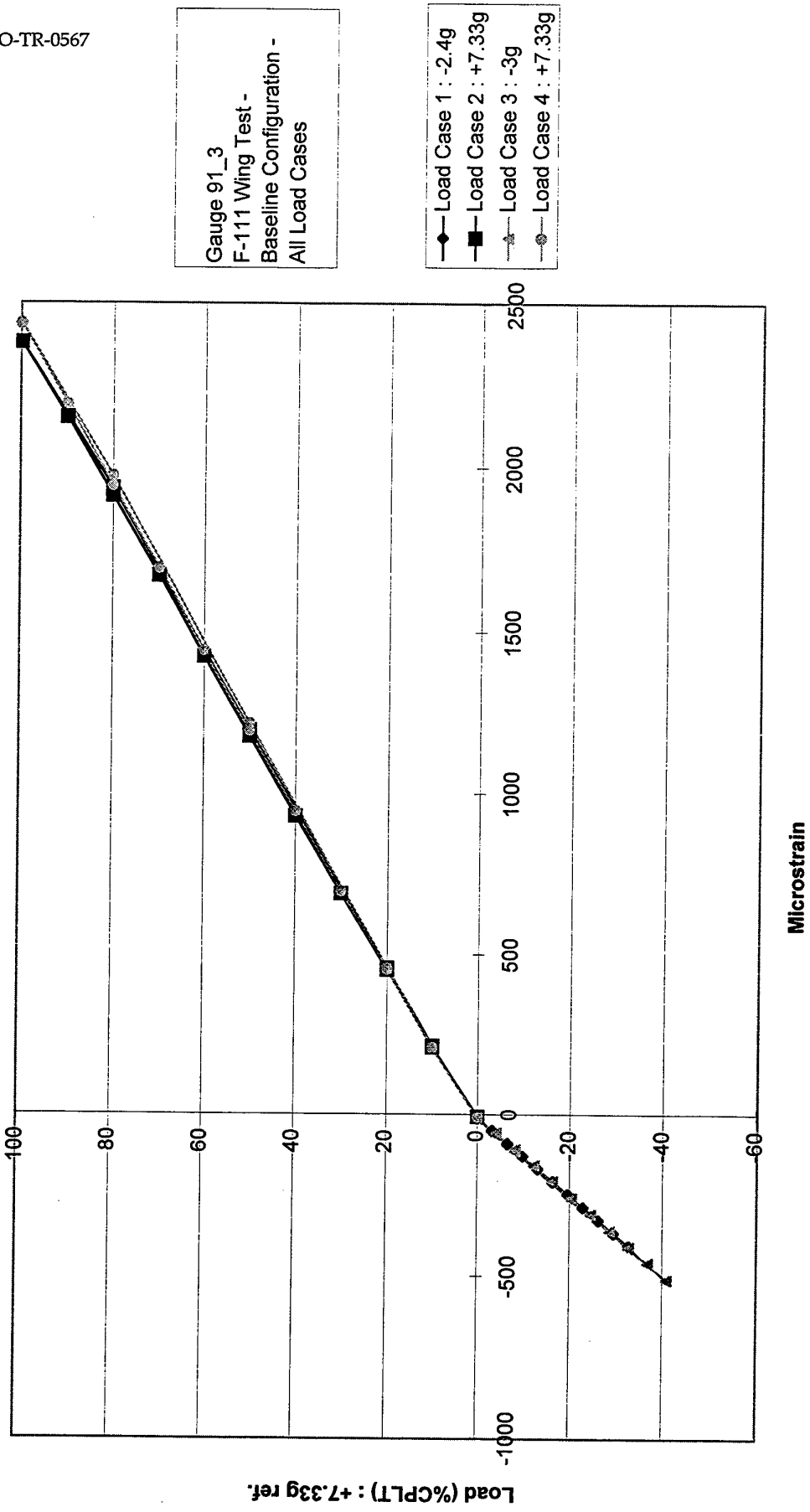

Figure C76 : Strain History For Inside Upper Plate - Mid Bay

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Kevin C. Watters

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PO Box 4331
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19. ABSTRACT

The strain distributions and magnitudes at two locations in the D6ac steel wing pivot fitting (WPF) of the F-111 aircraft have been evaluated by full-scale test of a wing. These locations, known as fuel flow vent hole number 13 and stiffener runout number 2 have been sites of in-service fatigue cracking. The structural features at these two locations produce large stress concentrations and extensive yielding occurs around them under cold proof load testing (CPLT) of the wing (which was simulated in these tests). These locations are subject to in-service reworking to remove detected fatigue cracks, and a range of reworks was simulated in these tests. The interaction of residual stress/strain states (after cyclic plasticity from CPLT loading) and material removal (during reworking) made interpretation of the strain versus load behaviour quite difficult. The difficulty was compounded by an overriding bi-linear elastic structural behaviour of the WPF and complex structural behaviour of the shear web in the WPF. A comprehensive strain versus load data base has been established for these locations to facilitate stress and fatigue analyses.